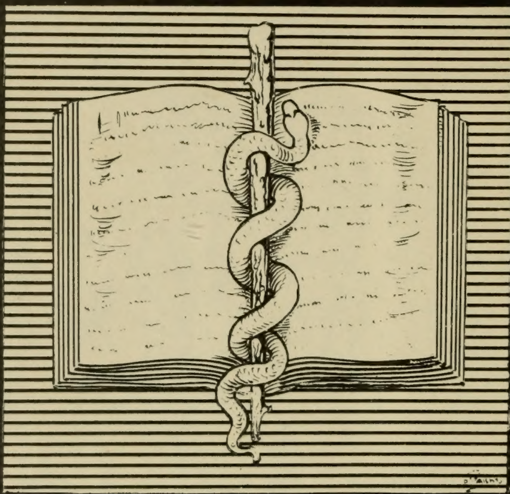

SOUTHERN

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ORIGINAL COMMUNICATIONS.

ARTICLE I.

Report on Spurious Vaccination in the Confederate Army. By S. E. HABERSHAM, M. D., formerly Surgeon in the Provisional Army of the Confederate States.

CHIMBORAZO HOSPITAL, DIV. NO. 2, November, 1863.

To Surgeon W. A. CARRINGTON, Medical Director—

Sir: I have the honor to inform you that, in accordance with your order of the 29th June, 1863, I have received all the patients sent into this Division, with a "peculiar eruptive disease," supposed to be the consequence of vaccination, and herewith forward you the results of my investigation into this anomalous affection.

In compliance with an order issued from the Surgeon General's Office in the month of November, 1862, general vaccination was practiced upon all soldiers as soon as they were admitted into this Division, and in order to insure the full protective influence of vaccination (not anticipating any evil consequences therefrom), the order was strictly obeyed, and all the patients, even those having recent scars upon them, were re-vaccinated. A few days after the insertion of the virus, and, in many cases, within twenty-four hours, the seat of puncture became very much inflamed, with a deep inflammatory blush around it,

which gradually implicated, in the severe cases, nearly the whole of the affected limb. A pustule rapidly formed, instead of a vesicle, which very soon discharged an ichorous fluid. This fluid was, in the course of forty-eight hours, converted into a dark, mahogany-colored, irregularly shaped scab, prominent, and firmly attached at its base. A dark-red areola of several lines in diameter, measuring from the edge of the scab, was then developed, which, in turn, seemed to exude an ichorous serum. This was soon converted into a scab surrounding in juxta-position the first, and presenting the appearance of a single scab. This process continued for several days, and there was often formed a scab, one inch or two and a half in diameter. "Pari passu" with the increase of this scab, the erysipelatous blush on the limb diminished, and when the blush had disappeared, this scab ceased to enlarge. As this inflammatory process subsided, the discharge lost its serous character, and seemed to be converted into pus, which exuded from under the scab, loosening its firm attachment at its base, and thus rendering it liable to be removed prematurely by the patient in his sleep, or even by the friction of his clothing. When this occurred, a foul bleeding, irregularly shaped phagedenic ulcer was revealed, with everted edges, and presenting the appearance of a Syphilitic phagedenic ulcer, involving the subcutaneous areola tissue, exposing, in many cases, the muscular tissue below. The process of destruction of parts did not end here, for the ulcer continued to increase, and from the loosened edges an ichorous discharge continued to pour out from under the skin, which seemed to destroy the edges of the ulcer, thus increasing its dimensions. Wherever the ichorous pus from this ulcer touched the sound skin, another pustule of a similar character was formed, in some cases reaching the size of the primary sore. This, however, was seldom the case, but a smaller

ulcer generally resulted, which often healed and cicatrized before the first.

The Axillary Glands, when the arm was affected, and the Inguinal Glands, when the leg was the seat of the disease, sometimes became inflamed and discharged pus, presenting the microscopic character of healthy pus. This enlargement of glands, however, did not occur in a sufficient number of cases to make it a natural sequence of the disease. Attending the early stages of the formation of the ulcer, before pus was discharged, there was always more or less pyrexia, with furred tongue and loss of appetite; these symptoms disappearing as soon as ulceration was established. In these highly aggravated cases, successive crops of pustules made their appearance on the affected limb, often developing themselves also upon the lower limbs of the affected side, but seldom crossing the mesian line, and never developing themselves upon the trunk or head.

The less malignant form of the disease resembled the first in character, but not in degree. For a few days after the insertion of the virus, merely a small inflamed spot was discerned, which seemed to be more the result of the injury done to the skin by the prick of the lancet than any inflammatory action resulting from a specific cause. About the fifth or sixth day a minute pustule was discerned upon a scarcely larger inflamed base. This pustule and areola gradually increased, but the diameter of the areola was not as great, and there was no deep inflammatory blush upon the arm, merely a diffused redness of several inches in diameter. The same process, however, took place—an exudation of serum from the areola—which, in turn, became a crust, and which gradually increased in size; but it never reached the diameter of the more malignant type; and when it was detached by the process of ulceration, which occurred at an earlier period, the

revealed ulcer was neither as deep nor as malignant in its appearance. The edges were not everted, and there was no discharge of pus from under the edges of the ulcer; it only presented the appearance of an ordinary ulcer, showing no tendency to increase, and but little to heal. Pyrexia very seldom attended this form, nor was the appetite impaired.

The third and mildest form of the disease made its appearance as a small pimple, in from two to ten days after the introduction of the virus, which gradually formed a pustule; a dark brown scab succeeded in from three to four days, which remained attached sometimes as long as two weeks, and when it become detached, a livid or brown spot was revealed, the size of which was equal to the scab. This scar, however, was very sensitive to the touch, and liable to bleed from the least friction of clothing, and when this occurred, it would exude serum or blood, and another scab would surely form. If the system became suddenly depressed from any cause, it would almost always assume the ulcerative process, and become a sloughing ulcer, which only healed with the general improvement of the system.

As thus described, this disease has prevailed in the Army of Virginia, both in field and hospital. The Surgeons of the Army of the Southwest, report its prevalence there. It was developed, in the early part of the year, in a Cavalry Regiment in the mountains of Virginia, the Colonel commanding suffering severely from the disease. In every case, its origin has been traced to the introduction of vaccine virus into the system. How far an epidemic cause may have exerted its influence in its early development, it is impossible even to surmise; we know, however, that it originated in Virginia, at a time when our Army was upon very short rations, and that many of the soldiers sent from the field at that time presented a decidedly

scorbutic appearance. Many had been reduced and were broken down by exposure to the inclemency of a cold Winter, and the depressing influences of low diet, want of clothing, and many other prolific causes of disease, calculated to deprive the blood of its healthy constituents, particularly of its fatty matter. Hence, this may have produced a predisposition. In verification of this fact, I will state, that when it was found how frequently the disease in consideration supervened upon Vaccination in this hospital in broken-down and depraved constitutions, it was deemed prudent to postpone the introduction of the virus until the patient was restored to a healthy condition by improved diet and medical treatment. At the first appearance of the evil consequences of Vaccination, I was inclined, with other Surgeons, to believe that the virus was impure, and, because of this suspicion, I threw away the matter we then had, and obtained a vaccine scab from Dr. Knox, a practitioner on Church Hill, who assured me he had used it in several cases with a perfect result.

The introduction of this virus into the arms of some ten patients resulted in the development of the disease in question in three of them, while in the remainder it produced apparently a true pustule. From this fact, and the immunity which healthy looking men enjoyed, I was led to believe that the predisposing cause existed in a vitiated and impoverished condition of the blood, and so reported in my first report, and that the introduction of pure virus into the system was the exciting cause of a latent disease. This view, I see, is also held by Surgeon Frank A. Ramsey, of the Department of East Tennessee, in a communication on file in office of Surgeon General. This view I have never had reason to change, though I am aware that many men, apparently in health, have suffered from the effects of Vaccination.

In one case, which I here quote, the influence of a good

condition of the general system seems to have exerted a wonderfully modifying influence.

Case No. 29.—J. L. Turner, a private, Company G, Fifth Virginia Cavalry, aged 27, married, parents healthy—he himself enjoying good health—never had any venereal disease. Entered the service, April, 1861—has been in service ever since—was vaccinated about a month ago, when in Hospital at Farmville.

This patient, Turner, was vaccinated last Winter by Assistant Surgeon Vaiden, of this Division. It not having had any effect upon his system, and feeling assured from this and previous Vaccinations that he was proof against the effect of it, he insisted upon being vaccinated by Assistant Surgeon Moses, from the effects of which he has suffered since, and for which he was on the 8th September admitted to this Hospital, presenting the following appearance: A number of pustules, resembling Impetigo, on left arm and leg, which were developed in successive crops, appearing as soon as the original pustule began to heal. This was a remarkably mild form of the disease, and was improving on Cod Liver Oil, when he was furloughed on the 20th September, being a paroled prisoner. This patient was young, vigorous, and comparatively healthy, when he received this Vaccine into his system.

The search, for parasitic or cryptogamic vegetation, with a good microscope, revealed none. The pustule was seldom developed where Parasites make their habitation, namely, in the bulbs, or at the roots of the hair. The pus presented microscopic characteristics of pus globules floating in a homogenous fluid. These globules were not as abundant as in laudable pus, and not so distinctly nucleated, and were irregular in outline in some of the cases examined. This appearance of pus globules, however, often exists in healthy or laudable pus, when it has been exposed to the air any length of time. In the many cases I have

examined, I have yet to find a patient who will acknowledge that he has had any Syphilitic disease at any period of his life, though many of them have had Gonorrhœa. This exemption from Syphilis, however, is not strange, since it is a very uncommon disease in the rural parts of our country, the inhabitants of which comprise the very large majority of our Army. We also know the tendency of the secondary form of Syphilis is to develope itself in the forehead, chest, back, and trunk, generally, and yet no cases, developed upon these parts of the body, have presented themselves to my observation. Many of the patients, also, have suffered long enough to have had the tertiary form of Syphilis developed nodes, etc., and yet no such symptoms have been seen by me.

From what I can learn, the Army of the United States has so far escaped these evil results of Vaccination. A few cases, however, originated among the Federal officers, in the Hospital of Libby Prison, who were vaccinated in the Prison by one of their Surgeons from his own arm, some weeks after their confinement, which presented all the characteristics of the disease as it has appeared in our Army. I was assured by these officers that they had neither seen or heard of such a result of Vaccination in their Army. Does not this fact alone lead us to infer that its cause or origin may be traced to some abnormal condition of the blood, in these cases, induced by confinement in a vitiated atmosphere, without the means of eliminating the *materies morbi* from the system by exercise, and care to the function of the skin?

The classification of this disease is difficult and unsatisfactory, since it commences as a Pustule, and assumes often the outward form of Rupia, which, by all dermatologists is classified among the bullae. If we classify it among the pustulæ, we find no disease there describing it accurately, some cases resembling Ecthyma, others Impetigo.

Inasmuch, however, as it oftener assumes the characteristics of Chronic Ecthyma, either in a mild or aggravated form, according to the healthy or unhealthy condition of the patient, I propose to name it Vaccine Ecthyma. Like all chronic cutaneous diseases, it shows a decided tendency to return whenever the system becomes reduced from any cause, or when the patient is exposed to causes which produce an undue action in the circulation of the capillary system. An undue amount of exercise in warm weather seems to excite its appearance. This was illustrated in those soldiers supposed to be thoroughly cured, and who were about to be ordered to their Regiments for duty, when a raid was threatened, in the month of July, upon the City of Richmond. These men were among the volunteers from the hospital to defend the city, and were marched through a hot sun some four miles to the lines at the extreme limits of the western end of the town. They returned with a new crop of pustules, which, however, healed by resolution in a short time.

Treatment.—There is every reason to believe that the disease results from a blood disease, only to be eliminated from the system by enriching the blood and supplying its deficiency of fatty matter with rich nutritious food and the judicious use of alteratives. It is vain to treat the ulcers locally, for without alterative treatment with nutritious diet, all the local applications which were tried seemed to aggravate rather than improve them; but as soon as the general condition began to improve, so did the ulcers. The milder cases began to improve a few weeks after admission, without any treatment, except dietetic, in conjunction with the Iodide of Potash, Syrup Iod. Ferri, and Sarsaparilla; in others, merely applying simple dressing to the ulcers, was found sufficient to subdue it. Under this treatment, all the cases gradually, but slowly improved. In the early part of August, we received a large supply of

Cod Liver Oil, and I was thus enabled to test fully the treatment which the supposed cause of the disease naturally suggested. Some few of the patients could not digest the Oil, but those who could began rapidly to improve, and many were well enough on the 18th of August to return to their Regiments, whilst others were thought well enough to be transferred to their respective State Hospitals, in compliance with an order issued at that time. Those who were unable to digest the Oil, continued the Syrup Iod. Ferri, which was thought the best alterative indicated in their cases. Their improvement was scarcely perceptible. In the early part of September, however, another effort was made by them to take the Cod Liver Oil, which they were enabled to do in a little Whiskey; their improvement soon became very evident to themselves, and though not yet entirely well, the ulcers are rapidly granulating. No new pustules are being developed, and the patients are in a fair way to recover. I have no doubt that the best remedy has been found in the Cod Liver Oil; and this, locally applied, and internally administered, with an entire change of air, and nutritious diet, will remove, and eventually eradicate, this obnoxious and filthy disease from the system.

From the above mentioned facts, I am led to draw the following conclusions: That the disease is pustular at its first appearance; that it resembles Ecthyma in its general character; that it is but a local manifestation of a general disorder, or vitiated condition of the blood; that this vitiated condition resulted from improper and spare diet, together with inattention to cleanliness, thus impairing the eliminating functions of the skin; that Syphilitic virus has had no influence in producing the disease; that the morbid effects have in most of the cases resulted from a deficiency in condition, independent of any imperfection in the Vaccine Virus; that the disease can only be removed by

those means calculated to improve the general condition, and restore the healthy play of all the functions.

—

SUMMERVILLE, April 28th, 1866.

Dr. JOSEPH JONES, Augusta—

Dear Sir: The above report of an anomalous disease, or result of vaccination, was written shortly after its first appearance in the Army of Northern Virginia, and after a careful study of the cases especially assigned to the Hospital under my charge for "treatment and report." At the time there was much discussion among the Medical Staff, both in Field and Hospital, as to the ætiology and pathology of the manifestation which by some, and, indeed, most of the observers, was attributed to impure virus, and especially syphilitical inoculation. This latter opinion was very ingeniously advocated by Surgeon Breckinridge, and no doubt many cases may have resulted from such an accident. In none of the cases, however, assigned to my Division of Chimborazo Hospital could I discover a sufficient number of symptoms to lead me to suppose that such might have been the cause, either in its prodroma or development, hence I could not attribute the cause of the eruption to any other than that assigned in the report. This view as to its ætiology was subsequently very ably maintained by Surgeon Frank A. Ramsey, in a report referred to me by Surgeon-General Moore, and which was preserved among my papers, but lost at the time of the evacuation of Richmond, together with the history of all the cases, and diagrams intended to illustrate the above report. In consequence of the loss of these papers this report is not as perfect as it should be; but I hope the general description and history of the disease is sufficiently clear and comprehensive to embrace every thing of practical importance concerning

this horribly disgusting and filthy accident, or result of vaccination, as seen in our army.

Since the termination of the war, I have had several opportunities of conversing with a few intelligent Surgeons of the Federal Army, and ascertained from them that such a disease had appeared among their soldiers in regions of the country where the scorbutic diathesis manifested itself among the troops, and to which the disease was generally attributed by them, though there were also Surgeons of that army who attributed it to syphilitic inoculation. I find the same view as advanced in the above report held by most of the Surgeons of the Federal Army, as stated in Circular No. 6, Surgeon-General's Office U. S. Army, November 1, 1865.

If you think the above report of sufficient importance to appear upon the pages of your journal, or if it can in any way advance the cause of medical knowledge, you are at perfect liberty to make use of it for that purpose.

With much respect, I remain,

Very truly, your obedient servant,

S. E. HABERSHAM.

ARTICLE II.

Report on Wounds of Large Joints made to the "Confederate States Association of Navy and Army Surgeons," Richmond, Va., 1864. [By J. B. READ, M. D., Surgeon in the Provisional Army of the Confederate States.]

Your Committee approach the consideration of the subject proposed, "A Report on the Wounds of the Large Joints," fully impressed with its importance to Military Surgery, and with many misgivings as to their ability to add anything new, or of consequence to the knowledge that already exists on the subject. They are, however, encouraged by the hope that if the records of the Military Surgery of the war, at this date, do not

afford any very useful statistics as to these serious injuries; that the very knowledge of the want of accurate and complete reports of cases will direct the attention of Surgeons in the Confederate States Army to making investigations of Hospital case books and records of the past, and to the keeping of minute and accurate notes of all such cases for the future.

The records in the Surgeon-General's Office, collected and tabulated by Surgeon Sorrel, from the Surgical Registers, sent in monthly, and the special reports of cases of interest, have been thoroughly studied, and such information as could be derived from them will be found collated in this report. Beside the records, we have called on Surgeons in charge of Hospitals, in and around the city, for the records of their experience, which will also be found embodied here. In the coming campaign of the Spring and Summer of 1864, it is to be hoped that such records of cases will be obtained as to settle definitely by statistics many points of great importance, and which the material on hand necessarily leaves imperfect, and perhaps erroneous. It may thus happen that some of the ideas now promulgated as to the treatment of these wounds may be faulty; should such be the case, none will be more glad to be so instructed than your Committee, for our sole desire in this report is the advancement of Military Surgery, and the benefit and welfare of our fellow men.

It is a matter of surprise in looking over cases of such important and grave injuries as those of the large joints, to find how little attention has been given to details of moment, and how loosely the reports seem to be strung together. In many records, the peculiar nature of the wounds; what tissue was particularly injured; whether one or all the bones entering into the formation of the articulation, with their articular cartilages, were implicated;

whether the foreign body inflicting the injury remained lodged in the joint or passed through, or whether the Synovial Sack itself was alone injured, are all absolutely ignored in the description of the cases. In other cases we are at a loss to know if the wound was produced by a round or conical ball, or by some cutting instrument, the date of the setting in of constitutional disturbance, the time that suppuration began in the joint, the method of treatment pursued; whether incisions were made primarily, secondarily, or at all, into the joint; whether warm or cold applications were employed; whether blood-letting, general and local, was resorted to; and in those cases which resulted well for the patient, the length of time demanded for the cure, and the condition of the joint as to the future utility of the limb, are entirely neglected. In the larger number of cases recorded, no mention is made as to whether they resulted in ankylosis or in good or partial motion. They are generally recorded in this fashion: Private A, Company B, of such a Regiment, wounded ——— date, part injured. Recovered, furloughed.

These cases thus reported are worse than useless, for they lead us to suspect that only the cures being thought wonderful, are reported; while the fatal cases have no report made of them, that result being the only one thought likely to occur. This will explain to the Association the rather extraordinary tables that have been compiled from the Surgical Register, which certainly presents some astonishing features. It may be true that figures don't lie, but in order to make this correct, there should be true record of every case of Joint Wound that has occurred during the war, and not of the cures alone.

The joints of whose injuries we shall treat are the diarthrodial, or those lined with synovial membrane. They consist of the orbicular or ball and socket joints,

and the hinge joints; under the orbicular, we meet with the shoulder and hip articulation; and of the hinge, the elbow, the wrist, the knee, and the ankle. The wounds inflicted on the joints of the upper extremities tend more generally to a favorable result than do those of the inferior. The simplicity of construction, and the smallness of the articulating surfaces of the orbicular joints give them decided advantage over the more complex hinge joints. These articulations consist of various tissues and membranes, which all act in modifying the inflammatory process, and the diseases that arise in them from traumatic or constitutional causes. The constituent parts are the synovial membrane, cartilage, bone, ligament and investing fibrous capsules.

The synovial sack is the part most generally involved, and which either primarily or secondarily plays the most important and often most destructive part in its diseases and injuries.

This is what a careful consideration of its physiological properties lead us to expect, for the more vascular, living organs are, and the greater the extent in which they are employed in secreting, the more liable they are to derangements of this function and inflammatory engorgements. These membranes are of extremely fine and thin structure, and are composed of epithelium and a fibrous envelope to which they owe their strength; between these is the connective tissue, in which ramify numerous blood vessels and nerves. The membranes are arranged in the joints as short, wide tubes, the open ends of which are reflected in upon themselves, and firmly united with the articular cartilage near its border, or rather to its enveloping perichondrium, having previously invested the bone and made connection with its periosteum. Where it adheres to the bone and soft parts it has great vascularity; but when it is reflected over the articular cartilage it is

thin and easily torn, and few if any vessels can be demonstrated in it. The synovial sack is really a serous membrane like the pleura and peritoneum, and resembles them in its function and uses. Certain flattened folds are often found just where the membrane unites the articular cartilages, and are denominated its vascular processes. The fluid secreted by this membrane is in health barely sufficient to lubricate the joints; it is clear and yellowish, thick and tenaceous, producing a sticky feeling when rubbed between the fingers. It consists of water 94.8, mucus and epithleum 0.5, fat 0.7, albumen and extractive matter 3.5, and salts 0.9. The result of the inflammation produced on this membrane by wounds is precisely the same that occurs in the serous membranes from the same cause. The membrane contiguous to the injury first becomes conjested and reddened, there is evident increase of vascularity, and less of its peculiar shiny satin-like appearance. The fluid within the sack under this hyperaemic condition becomes altered in character and increased in quantity, it becomes thin and serous, and has floating about in it effused plastic material. In a few cases, especially of incised wounds, the inflammation may stop here; but in a majority of cases where the lesion is produced by a ball, or by a blunt weapon, or when there is a passage-way for the entrance of air, the inflammatory process goes on to an unfavorable issue. The conjestion and vascularity of the synovial membranes increases, it becomes finally echymosed, and this condition results in the pouring out of a thin purulent fluid. The contents of the joint becomes enormously enlarged and turbid, the cells take on degenerative action, and pus is formed.

Under this inflammation of the membrane, other structures of the joint take on the process of disintegration; the articular cartilage becomes thin, soft, and ulcerated, and the articular facets of the bone become involved.

The acrid and offensive contents of the sack making their way through these ulcerated points, pass up through the cellular interspaces of the muscles. This destructive synovitis of joints in many cases ends by the death of the patient, or in the total loss of the use of the articulation.

The ends of the bones entering into the formation of the joints are covered by a whitish elastic tissue, the articular cartilage, one end of which is firmly united to the bone, and the other free in the cavity of the joint. This is covered over its edges by a membrane continuous with the periosteum, and called, from the tissue and its envelopes, the perichondrium. It is with this membrane that the synovial sack has such intimate connections that they cannot be separated. These cartilages are composed of a clear hyaline matrix filled with corpuscles, containing other cells and nuclei. These corpuscles are arranged in parallel lines. Near the bone the cartilage has a hard, calcified layer, called the articular lamella. No blood vessels or nerves permeate the substance of artificial cartilages, they are extra vascular, and are nourished by the vessels of the vascular folds of the synovial membrane, that project into the cavity of the joint, and by the tortuous convoluted and sinus forming vessels that exist in the cancellated structure of the epiphysis entering into the formation of the articulation; these lie directly under the articular lamella of the cartilage. This calcified lamella has the power of transmitting nutritive fluids from the blood to the cartilage corpuscles and cells, by endosmosis, and this force continues between the individual cells of the tissue itself. Cell life, is active and persistent in articular cartilage, their own peculiar changes for effete material and the reproduction of new are constantly going on, and the nutritive plasma for this is derived from the vessels of the bone, and from the "plicae vascular" of the synovial membrane. As articular cartilage possesses

no blood vessels of its own, but depends entirely for its nutrition upon those of its two adjoining tissues, any change in these must seriously interfere with its well-being. It is probable, however, that cell changes of increase and diminution continually at work within them, may produce changes of structure, and thus in many cases the cartilage may degenerate into bone, or be softened and disintegrated by ulceration. It is probable that, cartilage-like, the similarly nourished tissue, the cornea, may easily take on the ulcerative process.

Weber distinctly asserts that cartilage suppurates. Having no blood vessels of its own it cannot take on the true inflammatory action. The ulceration in articular cartilage, always in wounds of joints, begins from the free surface; under the influence of this process the cells break up, and the tissue crumbles away by granular disintegration, and leaves the articular ends of the bone free, and frequently covered by granulations which are prone to unite with others, and thus produce ankylosis. This is ordinarily the method of repair in joints destroyed by synovitis, by the pouring out of exudative plasma from both surfaces of the bones, and then being united by the coalescence of these together. The diseased conditions of the articular end of the bones in the joints are only of importance as they produce changes in, and affect the condition of the articular cartilages and the synovial membrane. In acute affections of the joints, such as those induced by Gun-shot Wounds, the fibrous capsules and the ligaments are not apt to be affected. They may soften and become elongated, or separated from their insertions, thus permitting the dislocation of some of the bones of the joint. They are only important pathologically in these cases, because of their dense unyielding structure, they retain and refuse exit to the accumulated fluids in the sack. Two tissues, therefore, the synovial

membrane and the articular cartilage, are principally implicated in wounds of joints, and it is to their peculiar action under the excitement of violence, and when brought into contact with air, that many, if not all, the destructive results of such wounds are directly attributable. Injuries to the bone, save insomuch as they are connected with the destruction of form and usefulness of the articulation, and the extension of inflammation from these two mentioned tissues, does not modify or exert any specific importance in the phénomena that arises.

The acute and destructive inflammation of the tissues forming a joint or membrane is called Traumatic Arthritis. It differs from ordinary acute arthritis, which may likewise be destructive to the parts affected, in this: in traumatic arthritis the disease begins from the centre of the articulation; and in simple acute arthritis it starts from the periphery. In the one it commences first by the inflammation of the synovial membrane; in the other, in the bone or surrounding tissue. The danger in these traumatic cases is much augmented by the presence of air in contact with the living membrane of the joint. This acts as an irritant to the sack, causes it to become engorged, and pour out a thin, reddish secretion, which rapidly becomes acrid and putrescent, and is mixed with flocculi of fibrin and blood. From the rapidity with which this secretion, when the over-distended sack has given way and its contents permitted to permeate through the boundaries of the joint into the meshes of the intermedullary ariola tissue, produces destructive consequences in the parts it comes in immediate contact with, it seems to have some peculiar irritant property. It is to this property of the inflamed membrane of rapid hypersecretion of a copius and easily putrescent fluid, that in most cases the great danger in joint wounds are due. This action of air on the sack and its secretions is established by the fact

that in many cases of injury to the joints by external force, in which no air is admitted, although the actual injury to the articulation may be great and extensive, still no such results ensue as are wont to happen after a slight wound in which air is admitted into the cavity.

Sir Benjamin Brodie, and other Surgeons, habitually made valvular incisions into the synovial sack, to extract loose cartilages from their interior; when this is done carefully, and air not admitted, no evil consequences result.

In many operations for this purpose, the distinguished Surgeon just mentioned, saw severe inflammation take place in but a single case, and in this the synovitis yielded to suitable antiphlogistic treatment, and no permanent injury to the joint remained.

Traumatic arthritis presents numerous points of great interest to the Surgeon. In many wounds of large joints, at first neither pain or great inconvenience is noticed. The articulation may be fairly opened, and the synovial fluid escapes; the articular end of the bones of the joint may be shattered, the epiphysis of the Femur may be split off in the largest joint of the body, the knee, and the patient experience little shock, and will often walk some distance with ease and comfort; so little inconvenience in many cases is experienced, that the wounded man refuses to believe himself seriously hurt, and, on this account, is unwilling to permit the Surgeon to undertake such operative procedure as his experience teaches him to be best and most suitable for the safety of his life or the preservation of his limb. We are aware, from a lamentable experience in these cases, that as certainly as a Gun-shot wound into the articulation exists, so surely will this traumatic arthritis supervene, and at a period from the reception of the wound that is very variable. It seldom occurs earlier than the first thirty-six

hours, and is often postponed until the tenth or thirteenth day. This condition is ushered in by a chill, or rather rigor, the pulse quickens, and becomes full and bounding, the eyes are bright, and the cheeks flushed; synchronously with these constitutional symptoms, changes take place in the injured articulation. The wound or wounds of the joints, those of entrance and of exit, if the missile has passed through, though previously looking healthy and discharging laudable pus, become tumid and swollen, the joint becomes enlarged, and a thin, reddish-brown serum, with small clots of blood with fibrin intermingled, leaks out from the external wound. The swelling increases rapidly, the skin and the periarticular tissues become tightly distended, red and engorged, the cutaneous veins seem filled with dark blood, and can be easily felt with the fingers, acute pain of a grinding character, comes on rapidly. The slightest motion of the bed, the slipping of a pillow, a heavy tread on the floor that gives a jar to the patient, causes him to cry out. The sensativeness of the part is so great that he can illy bear to have it touched or examined. The discharges soon become mixed with globules of pus. This quickly augments in quantity, becomes acrid, offensive and putrescent, and has a peculiar decomposed odor. The limb becomes swollen and œdematous, and when pressed with the hand has a feeling of crepitation caused by the passing under pressure of the gasses retained in the part, that are generated by the putrescent condition of the contents of the synovial sack, through the meshes of the ariola tissue connecting the muscles and forming their sheaths. The constitutional symptoms stride apace with the local mischief. The pulse becomes quicker and feebler, and rigors followed by profuse sweats take place. There are nightly exacerbations, marked by restlessness and profuse diarrhœa; abscesses form under the deep seated facia, and

between the muscles of the limb, dissecting, in many instances, the periosteum from the bone; at a later period more superficial deposits of pus collect under the integument, and between the outer layer of muscles, which thin the skin and "point" in divers places.

In a greater number of cases where the larger articulations are the seat of injury, hectic fever now supervenes, and colliquative diarrhœa destroys the little remaining strength, and hurries the sufferer to his end.

Sometimes, however, these abscesses break, and the sinuses empty themselves of purulent contents, or when opened by the knife of the Surgeon, discharge a large quantity of putrescent pus; and after months of patient endurance and great suffering, the case recovers with a limb, more often than otherwise, ankylosed in a faulty position.

Sinuses leading from diseased and necrosed bone, generally exist; and from the length of time consumed in the treatment of the cases, and the natural desire of both patient and Surgeon to place the limb in a position that affords most ease and rest, this faulty ankylosis can hardly be avoided, and the limb left is worse than none, for it is a useless encumbrance.

In these cases the rapidity of the fatal issue, or the tardiness of the protracted cure, depend mainly on the surroundings of the patient, as regards nursing, attendance and food; and more than all upon his age, strength of constitution, and freedom from previous bad habits and constitutional dyscrasia.

The collection of these purulent secretions in the tissues, and the direction the abscesses that form under the facia and in the ariola tissue of the intermediate interspaces follow, seem to be controlled by the position of the muscles, and their tendinous expansions as they are inserted into the heads of the bones constituting the

articulations, and by the position that the part injured must necessarily assume during treatment. In penetrating wounds of the shoulder-joint, the purulent depots are sometimes found beneath the periosteum, but more often external as far as the insertion of the deltoid in the humerus. They are also found at the anterior and posterior border of the axilla.

In some instances that have come under our observation they have been found to extend over the chest, under the pectoralis major muscle. The position of the arm in these cases causes the pus to gravitate downwards. In the elbow this dissection of the muscle by pus is downwards to the arm, for no matter how carefully the wounded arm may be placed on the pillow or splint, unless this be at a considerable elevation from the raised position, ordinarily assumed by the upper extremities whilst being on a bed, and especially if the patient be walking about, the fore arm and hand assume a general declination downwards. In wounds of the hip-joint, this being the most depressed point of the body in the bed, sinking as it were in a pit, the purulent depot is around the tuberosity of the ischium, and near the trochanter major, and the abscess will be found to point in the inner side of the thigh near the insertion of the adductor muscles, or in the groin, dissecting along the course of the iliacus internus and psoas magnus muscles. In this case the purulent matter often dissects up the periosteum from the Femur for some distance, and is held in this position by the deep fascia.

In the knee-joint unless the injury comes from the lower part of the articulation, the head of the tibia being alone penetrated by the ball, the pus invariably burrows upwards, first dissecting the periosteum from the Femur, and destroying the ariola tissue connecting the muscles under the deep fascia, afterward forming abscesses in the

more superficial muscles outside the fascia under the integument.

In the anatomical formation of this joint, we must bear in mind that two processes of the synovial sack or tube extend up a little higher than the upper edge of the patella, under the vasti muscles, especially under the vastus internus; we must recollect, also, how dense the fascia is at the joint, and how closely the tendinous expansion of the flexor and extensor muscles of the leg are connected with the capsule of the joint as they pass over and near it, to be inserted into the upper end of the tibia.

By referring to the pathology of the diseases of the synovial sack inclosing the articular ends of the bones, and the rapidity with which the covering cartilages take on the ulcerative and degenerative process, and the close and intimate connexion of the synovial membrane with the perichondrium lining the outer edge of the cartilage, and that the perichondrium is really nothing but the extension of the periosteum, we can without much difficulty, comprehend how, by the inflammation of this highly vascular envelope of the bones, it would become loosened as is its habit under this state of things, from the bone, and thus permit the acrid and putrid contents of the inflamed and disorganized joint to pass along beneath and come in contact with the parts adjacent to it.

Moreover we have the testimony of so great a pathologist as Weber, that cartilage itself suppurates in this way; when disintegration has taken place in it, the pus may pass out of the cavity, and light up anew, destruction in the tissues.

Penetrating wounds of the joints we have to treat of, may be classed as those produced by cutting instruments, and those caused by missiles projected from modern implements of warfare by the explosive force of gunpowder. The missiles usually employed in this war, and with the

injuries inflicted by which on joints we have to do with, are conical balls and shells. The wounds produced by the fragments of these explosive iron cases may in some instances be classed with incised wounds.

It will be well, perhaps, before treating directly of these wounds into the joints, to spend some moments in discussing wounds in situations near, but not penetrating or entering the synovial capsule. These wounds are called "periarticular" by Liguest. They may be inflicted by cannon or other balls, and may produce great destruction of the soft parts near the articulation. If the case progress favorably, no injury to the joint itself will ensue, except that the cicatrices that form during the healing process may have troublesome contractions, that interfere greatly with the use of the limb. This danger should always be borne in mind, and guarded against. Balls often pass in the neighborhood of the articulations, and inflict no actual injury upon them; yet, at some time during the suppurative period, traumatic arthritis will be lighted up, and run through its course as fatally and rapidly as if the joint had been first opened.

The inflammatory action excited in the parts after the reception of the wounds, and necessary in most instances for the healing of such injuries, extends to the articulation. The synovial membrane becomes inflamed in some cases, but generally, we think, the disintegrating process is started in the articular cartilage, by the inflammation that exists in the bone which underlies it, and upon whose vessels and those of the plicae vasculosae of the synovial membrane, it depends for its nutrition. We can readily call to mind some instances of this extension of the inflammation from the neighborhood to the joint, and the subsequent traumatic arthritis caused by this, followed either by the death of the patient or the loss of the use of the articulation.

A private in the P. A. C. S., wounded at the disastrous fight at Bristow Station, was received into the General Hospital, No. 1, in this city, under the charge of Surgeon Charles Bell Gibson. The ball entered the leg, and produced a compound comminuted fractūre of the fibula near its head; after some days it was thought necessary to excise the head of this bone; shortly after this, the patient had rigors, and grave constitutional disorder was developed. The knee-joint became swollen and tender, the thigh became œdematous and pitted under the pressure of the finger; there was a feeling of crepitus in the parts. Traumatic arthritis had been developed, and pus existed in the synovial membrane, and had burrowed up the thigh.

Surgeon Gibson made free and bold incisions in the line of articulation on each side of the joint leading from the patella down to the hamstring muscles, a large quantity of putrid purulent pus found exit through these incisions. The articular facets of the bone were felt to be rough and entirely denuded of their cartilages, the condition likewise obtained as to the articular facets of the patella. The leg was put upon a posterior splint, padded so as to fit into the hollow of the hams, and inclosed on the side by bracketed splints, devised extemporaneously by Acting Assistant Surgeon Howell Thomas, attached to the Medical Staff of the Hospital. The wound was kept constantly washed from all offensive discharges, and the whole of the articulation was freed from accumulations of putrid matter by being injected with warm water; none of these dressings required the displacement of the splint; from this time the patient improved, and when last seen (when he was transferred from this Hospital) was doing well. We have since learned that ankylosis had taken place. The wound had nearly cicatrized, and there was every prospect of a useful limb.

The following report of a case seen by Surgeon Michel and the Chairman of this Committee, is given as reported by Surgeon Gravatt, in charge of Seabrook Hospital, in this city. L. W. Wamsly. This man was wounded at the battle of Gettysburg, and had his leg amputated there, just above the ankle. He was held as prisoner of war some length of time during the Fall. He was transferred to this Hospital from No. 11, on the 15th of December, 1863, in a very feeble condition; numerous abscesses had formed along the leg, and at the time of his admission he had an extensive collection of pus around the knee-joint; this was immediately opened, and discharged a large amount of fetid pus, showing that it proceeded from a diseased condition of the bone. He was put upon a tonic, nutrative and stimulating plan of treatment, with a view to building him up sufficiently to bear amputation.

The Consulting Board, consisting of Surgeons Read and Michel, were convened on the 29th, and decided upon immediate amputation, which was performed by Assistant Surgeon C. M. P. Brock, by the circular method, Surgeon Michel compressing the femoral artery by digital pressure against the pubis; very little blood was lost, every thing was as favorable as possible under the circumstances.

Upon an examination of the limb after amputation, it was found that a portion of the shaft of the tibia, some four inches long, which had been split off by the ball in the first place, had been left in the first amputation, and gave rise to all the subsequent disease, viz.: caries and inflamed condition of the entire tibia, complete disorganization of the knee-joint, with carious condition of the articular surfaces of both the tibia and femur entering into the formation of the joint. Chloroform was used with the usual good effect, the patient rested tolerably well, and spoke of feeling better than he had done for

weeks, but died in twelve hours after the amputation. The disease of the joint in this case, evidently originated in the inflammation of the tibia. This condition of the bone seriously interferes with the nutrition of the articular cartilage, covering its head and thus producing degeneration and ulceration, and by this means opened the articular cavity. Had it been possible to recognize the condition of the knee-joint before hectic fever had been established, and free incisions made into the cavity of the articulation, so as to give vent to the retained secretions, might not a different result have been expected?

Many wounds noted in Monthly Surgical Registers, and entered as wounds of joints, are probably of this periarticular character, and are not penetrating wounds of the synovial membrane.

Lax and careless examinations of individual cases, that seem to be doing well in large Hospitals, or immediately after a battle, are too much the rule, and no special attention is called to the case unless some serious disturbance arises during its progress.

In wounds in the vicinity of large joints, especial diligence should be employed in their thorough examination, for often, on the early knowledge of their condition, the life of the wounded depend. In some cases there may be an orifice of entrance and one of exit, at opposite parts of the joint, and still the synovial membrane has not been penetrated.

This may be readily understood, when we think how often these injuries happen when the limb is strongly flexed, the patient at the time having been in rapid motion or movement, and when the limb is straightened, the position of the wound would naturally lead us to infer that the projectile has passed through the articulation, when such is not really the case. Moreover, we know that the conical ball in general use in modern warfare,

though it ordinarily goes with great directness of track through the part upon which it has impinged, at times is found to have deflected from contact with tissues, especially the fibrous, and have made a circular path for itself around a limb or joint; this is more apt to be the case, if in striking some substance before entering the tissue, the ball will have been turned sideways or butt foremost.

The treatment of these periarticular wounds, where they have been already decided to be so, and that they have not involved the tissues of the joint, must be conducted with the view of preventing the extension of the inflammation to the capsule. In the examination of these wounds the finger alone can be employed. The probe is inadmissable, from the danger of its being pushed through the delicate membrane. If the finger cannot be readily introduced into the orifice of the wound to make this exploration satisfactorily, the opening should be enlarged freely and the practice of "debridement" thus resorted to. The limb should be firmly and carefully fixed, in some immovable apparatus, so devised as to permit the dressing of the wound with suitable applications, and at the same time to keep the articulation perfectly at rest. This can, in the lower extremities, best be obtained by the bracketed splint of Mr. Abernathy; or in field practice by the fitting and adjusting Smith's anterior wire splint, bent into a bracket, and fastened securely by a straight splint, the piece between the bracket being sawed out. The wound should be treated on general antiphlogistic principles, constitutionally and locally; cold dressings are peculiarly suitable to these wounds, near joints, and may be employed, as ice in rubber bags or bladders, by constant irrigation, or by the drip. In general, water of the temperature of the nearest well or spring answers all purposes, as well as any other.

The swelling of the tissue external to the capsules,

which is apt to come on, if painful, must be combated with leeches or wet cups, the latter being probably of more utility on account of the incisions that are made in the skin, relieving tension. If only this condition of swelling around the joint obtains, the constitution does not seem to suffer, more than it ordinarily does, from the febrile reaction that exists in most cases of Gun-shot wounds of similar tissue, in other parts of the body.

During the treatment of these periarticular injuries, if rigors, excessive constitutional disturbance, with sudden swelling of the articulation, accompanied by acute pain, and distention of the superficial veins of the integument, should be developed, no time is to be lost, and free incisions must be made directly into the articulation, thus permitting all the putrescent contents of the sack to be evacuated.

If doubt exists in the mind of the Surgeon whether pus be in the cavity of the joint, an exploring trocar may be employed, by first drawing aside the skin, so as to make a valve to exclude the air, if the cavity be not diseased.

The joint being thus opened, and air freely admitted into contact with the already diseased synovial membrane, profuse suppuration must ensue, terminating in the total destruction of the membrane, and the disintegration of their articular cartilages. Our attention during the period must be turned to supporting the patient, by nutritious diet, and to modifying the character and diminishing the quantity of purulent discharges.

[To be concluded in next.]

ARTICLE III.

Report of two cases of Ligation of the Subclavian Artery. [By WM. H. DOUGHTY, M. D., Augusta, Ga.]

Private Jacob H. Kittrell, Co. D, Third Tennessee Regiment, C. S. A., was admitted July 15, 1863, into Walker's Division Hospital, at Lauderdale, Miss., having suffered an amputation of the right arm as near the shoulder-joint as it was possible to perform it, without involving it. This operation was performed on the 12th of July, near Jackson, Miss., for a Gun-shot Wound sustained in an action of that date. His general condition was good, and the stump healing kindly. At midnight of the 20th ~~July~~ a slight hemorrhage occurred, which was controlled by pressure.

At this time adhesion between the flaps was firm, and the ligatures upon the axillary artery and most important branches had not come away.

The hemorrhage recurred profusely at 10 A. M., 28th July, whereupon the patient was placed upon the table for the purpose of ligating the subclavian artery; but at the instance of consulting Surgeons it was determined to try the expedient of continued *digital* compression over the point at which the blood escaped. This was faithfully practiced, night and day, by a relay of assistants, until 6 A. M., 2d of August, when the bleeding again took place.

An attempt was then made to separate the flaps and secure bleeding vessels, but firm adhesion had long since taken place, and it was found impracticable to secure it without too great violence to the structures.

The only alternative was the ligation of the subclavian artery; which was adopted, the ligation being applied at its external third. The plan of operation was by an incision parallel to the upper margin of the clavicle, and subsequently by a slow dissection with the aid of a director

down to the vessel as it crosses the first rib. During the operation, the patient lost perhaps a pint of blood from the stump, notwithstanding the pressure employed to restrain it, in consequence of which it became necessary to administer stimulants freely. After the application of the usual dressings he was put to bed, and his condition on the succeeding day, August 3d, reported as follows: Has high irritative fever; is slightly nauseated; coughed up a clot of dark blood this morning, but had several hours of sleep during the night; stump is swollen, hot and painful.

Treatment.—Irrigation to the stump; warm water enema to open the bowels. Diet, beef tea and eggs.

August 4th.—Patient has less fever; is quite comfortable, as well as cheerful. General treatment continued, and perfect rest enjoined.

August 6th.—Patient rests well; is inclined to eat; pulse 96; respiration 24; stump looks healthy, and the local inflammation is subsiding. Treatment continued.

August 15th.—Patient continues to do well; pulse and respiration quiet; appetite good.

August 25th.—Is still improving; is gaining flesh and strength; stump is quite healed; ligature to subclavian is still apparently firm, not yielding to gentle traction.

September 4th.—Ligature came away to-day; the general condition of the subject is as good as could be desired. He was furloughed on the 25th September, and started for his home in Tennessee.

Remarks.—The success of this case is attributable to the robust constitution of the individual. The early and firm adhesion between the flaps of the stump, even after they had been forcibly torn asunder to secure possibly the bleeding vessel, shows that his blood was rich in plastic material.

Note.—We were afterward informed by Surgeon Daniel

F. Wright, who performed the primary operation on the field, that an unusual number of ligations were applied at the time, and from the size of these vessels he was led to apprehend the occurrence of secondary hemorrhage.

Case 2.—Private Jonathan W. King, Co. C, Twenty-ninth N. C. Regiment, was admitted October 5th, 1863, into Second Georgia Hospital, Augusta, Ga., with a Gun-shot Wound of the right shoulder, received September 19th, 1863, at the battle of Chickamauga. Sixteen days had elapsed since the receipt of injury, and at the time that our relations with the case commenced (8th October, 1863), the wound was very much inflamed, and discharging profusely; the entire limb was greatly swollen, with a serous infiltration and a diffuse inflammation of the parts, neither strictly erysipelatous, nor yet resembling ordinary phlebitis; there was no evidence of continuous infiltration of pus downward from the wound; no enlarged lymphatic glands; no enlargement and induration of the venous trunks. We ascribed the condition of the limb to an inflammation of the lymphatics (anguoleucitis).

Character and precise location of the Wound.—The ball entered anteriorly near the coracoid process of the scapula, passed directly through the joint, fracturing the head and surgical neck of the humerus, and emerged opposite the spine of the scapula.

All operative interference being at this time inadmissible, the arm was moderately bandaged; irrigation to the shoulder ordered, and quinine and opium administered to subdue irritative fever, relieve pain, etc.

At 11 P. M., October 10th, the patient doing tolerably well in other respects; hemorrhage occurred from the anterior orifice of the wound, which was soon arrested; but at 9 A. M., of the succeeding day, it gushed from both orifices so abundantly as to forbid reliance upon anything short of a ligature. With a comminuted fracture of the

humerus, and the state of the soft parts already cited, it was entirely impracticable to open at all the seat of injury; hence it was deemed best to ligate the subclavian artery and await the progress of events for further interference at the proper time, at the joint.

Accordingly, at 1 P. M., of October 11th, a ligature was cast around this vessel at its external third; the difficulties, to say nothing of the danger of the operation, were much increased by the anomalous position of the subclavian vein; instead of being in front of (but beneath) the artery, it was above it, and required to be held aside for the ultimate exposure of the vessel. At 3½ P. M., two hours after the patient was put to bed, there was no pulsation at the wrist, and the limb was quite cool; it was enveloped in cotton; and opiates, with strong beef tea, ordered as the general treatment.

October 12th.—The natural warmth of the limb has been restored; its capillary circulation is good, but no pulsation at the wrist can be detected; *the inflammation and swelling of the arm are unabated;* copious discharge of bloody pus from the wound; pulse is irritable and frequent. Treatment.—Brandy, quinine and iron. Nutritious diet.

October 13th.—The *inflammation of the arm, particularly about the elbow, where suppuration seems imminent, has increased;* no pulsation at the wrist; pulse is irritable and frequent. Treatment continued.

October 14th.—Pulse 90; patient is more cheerful, but has a slight diarrhœa; no pulsation at the wrist; *inflammation of the limb unchanged.* Treatment continued.

October 16th.—No material improvement; no pulsation at wrist; *arm suppurating at the elbow;* pulse 98; diarrhœa controlled. Treatment.—Free incisions for the discharge of the pus, and Tinc. Iodine (diluted), locally; general treatment continued.

October 17th.—Had a severe chill at 9 A. M.; pulse 92; diarrhœa returned; arm subsiding. Add 10 grs. quinine to usual treatment.

October 19th.—Another chill this morning; extreme restlessness through the night; pulse frequent and feeble. Hospital gangrene invades the posterior orifice of the wound. Treatment.—Increase the stimulants.

October 20th.—Gangrene appears in the wound, caused by the operation; at 9½ A. M., an oozing hemorrhage occurs from this wound; continued two hours; patient is evidently sinking. Treatment.—Brandy and ammonia.

October 21st.—Died at 2 P. M.; no further hemorrhage. An autopsy was made at 4 P. M.; Hospital gangrene had invaded both wounds; at the seat of operation, the subclavian artery was corroded at the superior part of its cylinder, where the knot of the ligature rested, but the other part was firm, and apparently undiseased. The axillary artery was intact, showing that the hemorrhage took place from some of its branches, but in the confused gangrenous mass, it was impossible to ascertain the precise vessel.

Remarks.—From the nature of the wound in this case, it is evident that a resection of the head of the humerus should have been performed upon the field; at the time of his admission into the Hospital, the condition of the wound and limb precluded the possibility of surgical interference. There was no alternative but to await a favorable moment for a secondary resection or amputation; to this end, means were adopted to abate the local inflammation, and sustain the strength of the patient. In the meantime, the hemorrhage occurred, adding greatly to the complication of the case.

By ligating the subclavian artery, it was hoped that three purposes would be subserved directly and incident-

ally, *i. e.:* 1st, The control of the hemorrhage temporarily, perhaps *permanently*. 2d, It would not interfere with the performance of the prospective operation, provided mortification of the limb did not ensue speedily from an arrest of its circulation, a contingency not very likely to follow on account of the already existing enlargement of the collateral vessels about the shoulder. And, 3d, By diminishing the supply of blood to the inflamed parts, a reduction of the inflammation would be produced in a short time, and the propitious moment for the operation at the joint hastened.

The hemorrhage was arrested, but no effect in the reduction of the inflammation ensued. It was not, however, increased. In all probability, if Hospital gangrene had not attacked the wound on the 19th, by the time the ligature came away it would have been practicable to perform the other operation. There were a number of cases of Hospital gangrene in the house at the time, but every precaution was taken to prevent its appearance in this case; everything except his removal from the Hospital was done, and this was at the time rendered impracticable, by circumstances over which we could exert no control. He died from this incidental disease before the ligature had time to come away.

At the time that this case was under observation, we had read with much interest the chapter on hemorrhage contained in a Manual of Military Surgery for the C. S. Army, published in 1863, and issued from the Surgeon-General's Office. It is understood that Surgeon H. F. Campbell, formerly of this city, but then having official relations with the Georgia Hospitals at Richmond, was the author of that essay. We confess to a great interest in that portion of it which refers to the "*incidental benefit*" hoped for from "*experimental effort to cure the inflammation in a limb by cutting off its arterial supply, by ligation of the*

main trunk which supported that inflammation." (Page 103, Manual of Military Surgery C. S. Army.)

The several cases there alluded to in which this expedient was adopted, presented almost parallel complications —secondary hemorrhage and inordinate local inflammation—with the one then on hand; and the success of the experiment in those cases fully justified its adoption.

The effect upon the inflammation was not, however, as hoped, in those reported by him. He says: "In all of the six cases the Hunterian operation was chosen, *with the distinct end in view of combating and checking, if possible, the destructive progress, and, in some, the septic tendency of the inflammation.* In all of these, the pain, the swelling and turgescence were almost immediately relieved, and the most remarkable change was soon presented, as seen in the character of the discharges. (See Note, page 104.)

In the case reported above, it failed to produce any such results.

ARTICLE IV.

A Lecture on Suppuration. By L. A. DUGAS, M. D., Professor of Surgery in the Medical College of Georgia, at Augusta.

The term Suppuration is employed to denote the process by which *pus* is formed, whether upon or beneath the surfaces of the body. More modern writers have used the word *pyogenia* or *pyogenesis*, to convey the same idea, and we may find it convenient to do likewise, by way of variety.

But, before we proceed to an explanation of this process, let us see what are the characters, physical, chemical, and microscopic, of the fluid called *pus*. In order to do so understandingly, however, we should remember that the term is often loosely applied to fluids

presenting very different peculiarities, and we should therefore confine our description to that alone which is denominated *laudable pus*, by which we simply mean *pure pus*—pus unmixed with extraneous elements.

Bad pus, sanies, or ichor is thinner than good pus, its color greenish, grayish, or brownish, its odor is more or less fetid, and it sometimes resembles an oily, mucous, or serous fluid, somewhat modified by the materials it contains. Pure pus may be obtained from acute abscesses, or well-conditioned ulcers in process of healing, and such as occur in habits not unduly depraved. It will then be found to be a homogeneous fluid of the color and consistency of fresh cream, presenting a yellowish-white tint, opaque, somewhat sweetish or insipid, usually more or less inodorous, and slightly unctuous or tenacious. It is a little heavier than water, and will therefore settle at the bottom of the vessel in which these two fluids have been mixed, and then allowed to be at rest. It may be coagulated by heat, alcohol, or hydrochlorate of ammonia, and will resist putrefaction for some time. When pus is allowed to stand at rest, it separates into two parts; the one, opaque and dense, occupying the bottom of the vessel, and the other, more liquid and transparent, floating above.

The chemical composition of true pus is variously stated by different observers. Gueterbock found in pus taken from a mammary abscess the following constituents:

Water	86.1
Fat, soluble only in boiling alcohol	1.6
Fat and osmazome, soluble in cold alcohol	4.3
Albumen, pyine, pus globules and granules, soluble neither in hot nor cold alcohol	7.4
Loss	0.6
	100.0

But the discrepancies observable among authorities on this subject evince still so much uncertainty in organic chemistry that I will at once proceed to the consideration of the microscopic appearances.

Much attention has been bestowed upon the microscopic examination of pus, whether pure or modified by perturbating influences, or by the presence of extraneous materials. Upon placing pure pus under the microscope it is found to consist of a thin, colorless and transparent fluid, called *liquor puris*, in which may be seen floating small spherical bodies, termed *pus globules*, or *pus corpuscles.* These are cells, whose diameter is estimated to be from two to three thousandth part of an inch, and which contain distinct nuclei. Their outline is irregular, and more or less rugged, but when the pus is mixed with a little water some of these cells appear to become distended by imbibition, and assume a more regular shape. Their nuclei, which appear to be numerous and not in contact with each other, are found, upon the addition of acetic acid, to become more distinct, to coalesce, and to vary in number from one to three or four, and sometimes more. The specimen should therefore be successively examined by itself, then with water, and lastly with acetic acid.

Besides these nucleated globules, pus often presents still smaller particles, called *granules*, estimated to be not more than the ten thousandth part of an inch in diameter, and which are considered by some as rudimentary cells, while others regard them as fragments of broken cells, or as particles of fibrin, having no relation to the cells.

Such are the microscopic appearances of laudable pus, the *pus* globule constituting its essential peculiarity. As the suppurative process deviates, however, from the normal standard, we find the product correspondingly affected, and the microscope may then reveal the presence of fragments of disintegrated tissues, withered or shrivelled cells, fatty matter, blood corpuscles, fibrinous shreds, etc. The *character* of the liquor puris may also vary, as well as the relative proportions of this and of the solids it contains. Pus coming from secerning organs may be

mixed with the secretions; hence, it may contain bile, urine, semen, etc., the presence of which may be readily detected by the microscope. That derived from specific diseases will contain the contagious element peculiar to each; but as this does not change its microscopic appearance, it may escape detection.

The purulent discharge from ill-conditioned ulcers, especially those connected with diseased bone, or those of a cancerous nature, is, not unfrequently, denominated sanies or ichor. It is thin, sometimes fetid, and often more or less excoriating to the surface over which it may flow. It often contains fibrinous flakes, grumous blood, and other detritus.

Carbuncles, diseased joints, etc., give rise to a thick lead colored pus, combined with lymph, which is sometimes called *fibrinous pus;* and *scrofulous pus* will not unfrequently be found to contain tubercular matter, besides shreds of cellular tissue and curdy flakes. Inflammation of the mucous surfaces yields an admixture of mucus and pus, which is therefore called *muco-purulent pus*, and which has served to perplex very much those who have sought to establish a distinction between mucus and pus. We now know that it is not necessary that the pulmonary mucous surface should be in a state of ulceration to furnish pus globules, and hence their presence does not possess the important diagnostic value formerly attached to them in the investigation of pulmonary affections.

With the graphic diagrams before you, representing the microscopic appearance of laudable pus, and of pus modified by the various circumstances to which I have referred, you are now prepared by an examination of other diagrams to see the difference between them and blood, milk, tubercular matter, cancerous matter, etc. You will observe that the blood corpuscles are much smaller than

the pus corpuscles, and present a very different appearance. When pus and blood are commingled, however, the pus globules are apt to be so masked that it requires very nice discrimination to detect their presence if in small numbers. The globules of milk and of tubercular matter are also smaller than those of pus, and radically different in appearance. The cancer cell, especially, deserves your careful attention, and will be fully studied when we come to treat of the class of affections to which it belongs.

Pyogenesis.—Having thus hastily, and perhaps, too briefly, studied with you the nature and characteristics of pus, I must beg leave to dwell a little longer upon the important question of *pyogenesis*, or the mode and mechanism of suppuration. How is pus formed? Is it formed at the expense of the surface upon which it is found? Does it exude already formed from the blood vessels? Is it the result of an act of secretion, similar to that which takes place in secerning organs? or is it not a substance formed on the surface upon which it occurs, out of materials poured upon it by the capillaries?

Pus is not formed *at the expense of the surface upon which it is found*, because this would lead necessarily to a loss of substance, which does not always attend suppuration, however abundant it may be. Suppuration of the skin may occur and be abundant for an indefinite length of time without loss of substance. It is true that the cuticle will be elevated, dissolved, or otherwise destroyed by the suppurative process; but this coating, you know, possesses no vitality, and should, therefore, not be taken into consideration in studying the morbid vital act of suppuration. Whenever a suppurating surface or locality evinces a loss of substance, this is in consequence of the disintegration of the tissues, which nutrition fails to reproduce. Inasmuch as the particles which constitute

our tissues are continually disintegrating and being replaced by new nutritive deposits, it follows that any impairment or suspension of the great function of nutrition in any given locality, must of necessity be attended with a loss of substance. No loss of substance can take place so long as the processes of disintegration and of nutritious deposit keep pace with each other. If disintegration be in excess, there will be loss of substance, and if nutrition be in excess, there will be hypertrophy. The act of suppuration has, in itself, therefore nothing to do with the loss of substance which sometimes accompanies it.

Does pus *exude from the blood vessels ready formed?* It has been long known that pus contains all the elements of blood, with the exception of its coloring matter, and also that pus is often found ready formed within blood vessels. The mere fact that pus contains most of the elements of blood, only shows that many of its constituents are derived from the circulation; but we should bear in mind that pus contains peculiar characteristic globules which do not belong to blood, and which are generally admitted to be too large for transudation through the pores of the blood vessels. Admitting then, that the elements of pus are derived from the blood, we must also concede that they have to undergo some change before they can constitute pus. This change being brought about after the exudation of the blood elements, must necessarily take place outside of the blood vessels, and the pus cannot therefore be said to exude ready formed from the blood vessels.

It is true that pus is frequently found within blood vessels; but in these cases the pus is introduced into the vessels of a suppurating locality in consequence of accidental or ulcerative opening of their walls, thus allowing the pus to enter them without difficulty; or it may be formed upon the lining surface of the blood vessels under the same influences and in the same manner as it is

produced upon the serous membranes elsewhere. There is no reason why suppurating inflammation may not occur just as well in the internal coat of arteries, veins, and lymphatics as upon any other surface of the body. In such cases pus would be found in the blood, but would not escape from its vessels unless these were opened by ulcerative or other process, for as I have already observed, pus corpuscles are too large to exude through the vascular coats.

With regard to the theory which assimilates suppuration to the *act of secretion* as this occurs in the liver, kidneys and other secerning organs, and to which Hunter lent the sanction of his great name, I would remark that secretions are the products of organs specially constructed for the purpose, that they are the result of physiological action under the influence of special nervous supplies, and that it is not safe either in physiology or in pathology to admit that a secretion can be formed in any other way, or by accidental causes. Secretion is a complex act, by which certain elements are taken from the blood and recombined so as to give rise to a new product. The liver does not separate bile, as such, from the blood, although it unquestionably derives from this source the materials which go to to form the bile—and we have no good reason to believe that bile can be formed by any other organization than that peculiar to the liver. And yet we are asked to admit that pus, a peculiar and well defined product, may be secreted by organs and tissues the most dissimilar, and never in the physiological condition of the parts, but on the contrary always under the influence of morbid action. Pyogenesis is essentially a morbid act, and should therefore not be confounded with those which are strictly physiological.

We now come to the consideration of the last question, and I repeat it: *Is not pus a substance formed on the surface*

or in the locality in which it occurs, out of materials poured upon it by the capillaries? This view has been advocated by many able pathologists; but they differ with regard to the *manner* in which the change is effected, and predicate their belief upon theories more or less groundless. To James Paget, of London, was reserved the honor of solving the question by direct observation, and by the exercise of that rare inductive discrimination which characterizes all his investigations. In his Lectures on Surgical Pathology, delivered at the Royal College of Surgeons of England, we find his views most beautifully unfolded, as he passes from the consideration of the repair and reproduction of injured and lost parts, to the study of the materials for the repair of injuries, the processes by which wounds are repaired, and finally to suppuration and the perfection of scars.

We are reminded of the correctness of Mr. Hunter's declaration that "injuries done to sound parts are of two sorts, according to the effects of the accident. The first kind consists of those in which the injured parts do not communicate externally, as concussions of the whole body, or of particular parts, strains, bruises, and simple fractures, which form a large division. The second consists of those which have an external communication, comprehending wounds of all kinds, and compound fractures. The injuries of the first division, in which the parts do not communicate externally, seldom inflame; while those of the second, commonly both inflame and suppurate." Paget then states that "the healing of open wounds may be accomplished by five different modes, namely: 1. By immediate union; 2. By primary adhesion; 3. By granulation; 4. By secondary adhesion, or the union of granulations; 5. By healing under a scab. The repair of subcutaneous wounds may be effected by immediate union, but is generally accomplished by con-

nexion, or the formation of bonds of union between the divided and retracted parts. Very rarely it is effected by means of granulations without suppuration." "Of these modes, it is the peculiarity of the first, or process of immediate union, that it is accomplished by the mere union or re-joining of the divided parts, without the production or interposition of any new material. In all the others, new material is produced and organized." Now this new material is called lymph, or coagulable lymph, the essential vital property of which is "its tendency to develope itself; a tendency which it has of its own properties. It thus displays itself as a plasma or blastema; a fluid to be classed with those others that manifest the capacity to assume organic structure; such as the lymph and chyle that develope themselves to blood, and the semen, which, at first fluid, gradually developes itself into more and more complex structures.

"The natural tendency of coagulable lymph is to develope itself into the fibrous, or the common fibro-cellular or connective tissue—the lowest form of vascular tissue, and the structure which, in nearly all cases in man, constitutes the bond by which disunited parts are again joined."

"The development of the fibro-cellular or connective substance through nucleated cells may be observed in the material of granulations, or in that of inflammatory adhesions (whether in a serous sac or in a wound healing by primary adhesion), in inflammatory indurations, and in the naturally developed fibro-cellular tissue of many parts. The process is, with slight and apparently not essential modifications, the same in all.

"The cells first formed in granulations are spherical, palely or darkly nebulous, from about 1-1800th to 1-2500th of an inch in diameter. They contain a few shining, dark-bordered granules, and lie imbedded in a variable

quantity of clear pellucid substance, by which they are held together, and which it is hard to see, unless acetic acid be added. When water is added, it penetrates the cells, and as they swell up their walls appear more distinct, and their contents are diffused. Some cells thus become much larger and clearer, and show in their interior numerous vibrating molecules; others display fewer molecules, but a distinct, round, dark-bordered nucleus, which appears attached to the inside of the cell-wall. Such a nucleus is rarely seen in granulation-cells, unless they are distended with water; acetic acid, acting more quickly than water, brings the nucleus more evidently and constantly into view, and often makes it appear divided inte two or three portions."

Having with much minuteness detailed the process of healing by granulations, Paget concludes as follows: "But let me add, that although one may so clearly trace in the development of granulation-cells, and in the end which they achieve by the formation of fibro-cellular tissue and cuticle, an imitation of the natural processes and purpose of the corresponding developments in the embryo, yet is there a remarkable contrast between them, in regard to the degrees in which they are severally liable to defect or error. We can scarcely find examples of the arrests or errors of development of mere structure in the embryo; but such events are quite common in the formation of granulations, as well as of all other new products. All the varieties in the aspect of granulating wounds and sores, which the practiced eye can recognize as signs of deflection from the right way of healing, are so many instances of different diseases of the granulating substance; diseases not yet enough investigated, though of much interest in the study of both the healing process and the organization of new products in inflammation.

"A comparatively few observations enable one to trace

morbid conditions of these new structures, closely answering to those long known in the older and more perfect tissues. Thus, one may find simply arrested development of granulations; as in the indolent healing of wounds and ulcers, whether from locally or generally defective conditions. Herein even years may pass, and the cells will not develope themselves beyond one or other of their lower forms. There is probably a continual mutation of particles among such cells, as in common nutrition; or they may increase, as in growth; but no development ensues, and the wound or the ulcer remains unhealed.

"In other cases, the cells not only do not develope themselves, but they degenerate, becoming more granular, losing the well-marked characters of their nucleus, and acquiring all the structures of the pus-cell; thus are they formed in the walls of fistulæ and sinuses. Or, worse than this, the granulation-cells may lose all structure, and degenerate into a mere layer of debris and molecular substance. Thus they may be found on the surface of a wound for a day or so before death or exhaustion, or in erysipelas, or fever; and in this state they are commonly ejected when a granulating wound ulcerates or sloughs.

"With more active disease, granulations become more turgid with blood, or œdematous: such are the spongy masses that protrude beyond the openings leading to diseased bone, or, they inflame; and abundant large inflammatory granule-cells are found among their proper structures, or, they suppurate internally, and purulent infiltration pervades the whole mass.

"All these are among the many hindrances to healing; these are the dangers to which the healing by granulations is obnoxious; it is the proneness to these things that makes it even slower and more insecure than, in its proper course, it might be. And these are all instances of a class of changes which it is most important to study

for exactness in morbid anatomy. I mean the diseases of the products of disease."

"The formation of granulations is not necessarily attended with the production of pus. I have already referred to this fact when speaking of the formation of sub-cutaneous granulations, such as are sometimes seen on the end of bones that do not unite, in the ordinary way, after simple fractures. Mr. Hunter also expressly describes these cases; and the same kind of granulations without suppuration may be sometimes seen springing from the ulcerated articular surfaces of bones, in cases of diseased joint without any external opening. However, when granulations are formed on an open wound, there is always suppuration."

"Pus not distinguishable from that of granulating wounds is formed in many other conditions; as in inflamed serous and mucous cavities, and in abscesses. But the histories of all cases of the formation of pus concur, with that of suppurating wounds, to the conclusion that pus may be regarded as a rudimental substance ill-developed or degenerated; as a substance essentially similar to the materials of granulations, or of the lymph of inflammatory exudation, but which fails of being developed like them, or, after having been developed like them to a certain stage, degenerates.

"To illustrate this relation between the pus and the granulations of healing wounds, I may state that the last figure (in the illustrations) was copied from sketches that I made, at the same time, of some granulation-cells from the walls of a sinus, and some pus-cells from a healthily granulating wound. I chose those sources purposely, that I might be able to compare ill-developed granulation-cells with well-constructed pus-cells; and a comparison of them showed that, whether as seen without addition, or as changed by the action of water and acetic acid, they

were not to be distinguished from one another. Had I not seen the vessels in the tissue that the granulation-cells formed, I might, in the first examination, have almost thought I was deceived in thinking they were not pus-cells. The six varieties of the appearances of the cells which are represented might have been taken from either source; so might some other varieties; but these may suffice to show the apparent identity of structure between well-formed pus-cells and ill-developed or degenerate granulation-cells, such as are found in the walls of sinuses and the like half-morbid structures. I do not mean to say, generally, that granulation-cells and pus-cells cannot be distingued; for between well-formed granulation-cells, such as are found in healing wounds, and any particles that are usually found in pus, certain distinctions are almost always manifest. The pus-cells are darker, more and more darkly, granular, more various in size, and more various, not in shape, but in apparent structure, more often containing numerous particles, like fatty molecules, more rarely showing a nucleus when neither water nor acetic acid is added, and much more commonly showing a tripartite or ill-formed nucleus under the action of the acid. None, however, of these characters is indicative of essential difference; and between even the widest extremes there are all possible gradations, till distinction is impossible; so that when you place, as I have often done, ill-developed or degenerate granulation-cells, on one side of the microscope-field, and pus-cells on the other, there is not a form of corpuscle on the one side which is not repeated on the other.

"From this, one cannot but conclude that the cells of pus from wounds are ill-developed or degenerate granulation-cells. Some of them may be degenerate, *i. e.*, they may have been, as granulation-cells, attached for a time to the surface of the granulation-layer, and having lived

time, may, in ordinary course, have been detached and shed, as epithelial cells are from healthy surfaces. They may be thus detached after more or less degeneration, and hence may result some of the modifications that they present. But some pus-cells, I imagine (at least in the healing of wounds), may be ill-developed; that is, imperfectly formed of material which exudes from the surface of the granulations, and which, being exposed to the air, or being too remote from the supply of blood, cannot attain its due development, and, in an imperfectly developed state, is soon cast off. It cannot but be that organizable matter is constantly oozing from such a surface as that of granulations; but the conditions into which it enters on that surface are such as are very likely to hinder any but the lowest or some imperfect organization.

"The many characters of imperfection or of degeneracy that pus-cells show, accord with this view; such as the general imperfection of their nuclei; the frequent abundance of fatty-looking granules in them; the large quantity of fatty matter that analysis detects in pus; and the limitation of the cells to certain forms, beyond which they are never found developed, though none of these forms is more highly organized than that of the youngest or most rudimental granulation-cell.

"A further confirmation of the opinion that pus-cells are ill-developed or degenerate granulation-cells, is furnished in the cases, to which I shall hereafter refer, in which pus-cells are produced after, or together with, inflammatory lymph-cells; as in abscesses, inflamed membranes, and the like. Now such lymph-cells are not distinguishable in apparent structure from granulation-cells, and, like these, they may show every gradation of form to that of the pus-cell.

"But it is not only in the cells that we may trace this appearance of the degeneracy or incomplete development

of pus. It is equally shown in the fluid part, or *liquor puris*, which, unlike the intercellular substance of granulation and inflammatory lymph, is incapable of organization, even when, by evaporation or partial absorption, it assumes the solid form. The liquor puris answers to the solid or organizable blastema of granulations; and as undue liquidity is among the most decided marks of ill-formed pus, so the abundance of the blastema, in proportion to the cells, is one of the best signs that granulations are capable of quick development."

I have thus freely quoted from the work of Paget, in order that I might give you his views in his own language. I could have substituted none more concise and graphic, and I think that you will agree with me that he has satisfactorily demonstrated that pus is not formed at the expense of the surface upon which it is found; that it does not exude already formed from the blood vessels; that it is not the result of an act of secretion; but that it is really formed on the surface upon which it occurs, out of materials poured upon it by the capillaries.

It would now be interesting to determine whether any good end is attained by the formation of pus, or, in other words, what are the uses or purposes of suppuration. We may understand that the tender granulations may be somewhat protected by the pus, especially if this be of good character and be permitted to form a scab by drying. But beyond this I can conceive of no good it can accomplish. In abscesses and phlegmonous inflammations it would rather seem to constitute *the disease*, and, as such, can hardly be regarded as salutary, unless by the visionary advocates of an obsolete pathology, who considered all discharges beneficial, by eliminating supposed impurities of the blood. It is true that when splinters or other foreign bodies are introduced into the tissues, a process of elimination is set up, characterized by suppurative

inflammation and ulcerative destruction, by which an exit is made for the extraneous material. But, even in these cases, the formation of pus is only incidental to the other acts of inflammation, and the expulsion of the offending object might be secured by the liquified detritus of broken down tissues, without necessarily involving the formation of any genuine pus.

With regard to the effects of suppuration upon the healing of wounds, ulcers, etc., it must be obvious, that, inasmuch as pus results from an abortive attempt at the organization of granulations, these must be retarded in their evolution in a direct ratio with the quantity of pus formed. Without this interrupted organization there would be no pus formed. Hence it is that any course by which we may impede the formation of pus, must favor the development of granulations, and vice versa, by provoking suppuration we must retard granulation.

The materials constituting pus, being confessedly derived from the blood, and we may add, from the most important elements of the circulating mass, it follows that the quantity of pus daily discharged must be the measure of the tax upon the blood to which the patient is subjected. And, if it be true that the daily loss of even a small quantity of blood must ultimately impair the general energies of the system, we have the ready solution of the problem of the injurious effects of long continued suppuration. The hectic fever, night sweats, emaciation, diarrhœa, loss of appetite, etc., which so often accompany extensive or protracted suppuration, all clearly indicate the radical injury done to the great pabulum of life. The patient has to contend with the combined influence of the irritation attending inflammation and of the drain upon the circulation, which is thus being continually impoverished. Hence the difference between the effects of this drain, and those of daily or often repeated hem-

orrhage, by which the patient may be rendered anemic without hectic fever and its concomitants. Instances in illustration of this difference very often present themselves in individuals affected with bleeding hemorrhoids, who lose more or less blood almost every day. Their whole system testifies to the injurious effects of such repeated loss of blood; they become anemic and all their energies are impaired in proportion to the degree of anemia; but they have very few of the symptoms which characterize the injurious effects of protracted suppuration.

Another element of constitutional injury arising from suppuration, is to be found in the fact that pus, or some of its combinations, occasionally find their way into the circulation, so as to contaminate it to a greater or less degree. It has often been argued that pus cannot be absorbed, because its cells are too large to pass into the veins or lymphatics, unless these be opened by accident or diseased action. This may be true, and yet these pus-cells may themselves become dissolved or otherwise destroyed, so as to enter the circulation in this altered condition; or portions of the liquor puris, which is not amenable to this objection, may become so vitiated as to give rise to injurious consequences when absorbed. Now the degree of poisoning to which the blood is thus exposed may, and probably does, vary from the slightest to the most overpowering effect. Hence it is that, while suppuration, even considerably protracted, may exist without seriously implicating the general condition of the system, there are instances in which hectic fever is induced, and others in which the purulent infection, so called, proves speedily fatal; the victim dying with all the symptoms of blood poisoning by animal matter.

While the beneficial effects of suppuration are therefore very problematical, it is quite evident that the formation

of pus is fraught with mischief in very many instances, and that it should be regarded as a disease demanding our most serious attention. Instead of yielding to the popular error, that suppuration is necessary to the process of healing, we should, on the contrary, look upon it as one of its injurious complications, and endeavor to lessen it as much as possible, if we cannot altogether prevent it; we should also use such means as may prevent it from assuming the condition of a poisonous material which may contaminate the whole economy. Let us recollect that pus is the result of an abortive attempt at organization, and that, when once formed, it may, more or less readily, undergo the putrefactive process; and we shall at once perceive the propriety of a resort to antisceptics, for the double purpose of lessening the tendency to suppuration, and of preventing the decomposition of the pus after it has been formed.

Among the antisceptics of the Materia Medica, there are some which exert a much greater influence in lessening suppuration than others. It would perhaps be well to designate these as *anti-pyogenics*, for the purpose of drawing attention more forcibly to them than has heretofore been done. As an anti-pyogenic, chloride of soda (Labaraque's solution), stands pre-eminent. For some unaccountable reason, that prepared by the French is incomparably superior to any made in the United States, and should therefore always have the preference. The printed directions which accompany the French bottles may, however, lead into error with regard to the strength to be used for lessening suppuration, as they refer principally to the dilution proper in cases of mortification. I find that half an ounce of French chloride of soda in a quart bottle of water, will usually make a solution of the proper strength for our purpose. A safe rule is never to make it so strong as to be painful when applied; for if too strong it will act as a powerful irritant, and increase, instead

of lessening, the suppuration; made of the proper strength, the solution should be used as a wash, once or twice a day, and the lint of old linen used in dressing should be kept wet with it.

A solution of alum (two to four grains to one ounce of water), or of tannin (one or two grains to one ounce of water), and the vegetable infusions containing tannin as the active principle, especially the red oak bark infusion, will all be found beneficial—but they must not be used too strong. I have derived much advantage from the use of tar water, which can be procured upon any of our plantations. This is prepared by simply pouring a gallon of hot water upon a gill of pine tar, and stirring it a little. The water will soon become saturated, and may then be used without farther dilution, in the same way as directed for the diluted solution of chloride of soda. I may here add that it is the best disinfectant I know of in hospital gangrene, and altogether, I think, the best application.

In conclusion, I must urge upon you to watch the condition of the system whenever you have to treat wounds or diseases attended with suppuration, so as to detect the first inroads upon the general stamina. The patient should be sustained by good and nutritious diet, and any constitutional deterioration should be promptly met by tonics; the best of which, under such circumstances, is the muriated tincture of iron. This should be administered three times a day in doses of from twelve to fifteen drops in a tumblerful of sweetened water. You should give it thus largely diluted, in order that it may not offend the stomach, as it would be very apt to do if given in a more concentrated form. It may be taken either before or after eating, as the patient may prefer. The tartrate of iron and potash, so highly recommended by some, is apt to act upon the bowels, and thus defeat our object. A moderate allowance of malt or alcoholic liquor is usually

beneficial, and always *necessary* in the treatment of those addicted to intemperance.

P. S.—Since the delivery of this lecture, I find that Professor Polli, of Milan, has called the attention of the profession to the treatment of zymotic diseases by the alkaline sulphites; and the experiments made by him with this new class of remedies, seem to indicate that they would be of great value in purulent infection or pyemia. Sulphite of soda is given in doses of thirty grains, three or four times a day, in water. It is well worthy of trial, especially as it is said to be perfectly harmless.

ARTICLE V.

Notes upon the History of Hospital Gangrene. By JOSEPH JONES, M. D., Professor of Medical Chemistry, in the Medical Callege of Georgia, at Augusta.

It is impossible to determine the time of the first appearance of Hospital Gangrene. The records of the ancients furnish only negative testimony: that is, we are not justified in asserting that this disease had never appeared amongst the wounded of the immense armies of the ancients, simply because a description is not preserved in the fragments of their writings which have come down to us. Not only have many of the works of the ancients been lost, but it would also appear, that amongst some of the greatest nations of antiquity, it was impossible that any accurate history of diseases could have been written, because of the absence of both medical science, and of physicians devoted to the treatment of diseases. Thus Herodotus affirms, that the Assyrians, even at the time of the greatest splendor and power of the Babylonian Empire, had no physicians; but were in the habit of exposing the sick in the market place, that

they might confer about their diseases with the passing multitude. If the passers by had themselves been afflicted with the same disease, as the sick person, or had seen others so afflicted, they advised him to have recourse to the same treatment, as that by which they escaped a similar disease, or as they had known to cure others. Herodotus also relates, that amongst that nation of the Indians called Padæans, who were cannibals, it was the custom when any one of the community was taken sick, whether man or woman, for the nearest connections to put the sick person to death; and they justified this barbarous treatment, on the ground, that if the sick person wasted with disease his flesh would be spoiled. Those attaining old age, were in like manner sacrificed and devoured. Herodotus adds, that few amongst them attained to the state of old age, for before the limit of life was reached, every one had been destroyed in consequence of some distemper.

Whilst it may be true, that in the early ages of the world, there could not be much occasion for medical science, on account of the simplicity of manners, and plainness of diet, and temperance in meat and drink, and the active pastoral life of the first inhabitants; and that as the world became more populous and the people were gathered together in crowded cities, various epidemic and contagious diseases appeared, which were before unknown: at the same time, it is in like manner true, that, the texture and materials of construction and scarcity of the clothing of the ancients, tended to the generation and propagation of various contagious diseases, and especially of skin diseases. Reasoning from our present knowledge of the mode of origin and propagation of Hospital Gangrene, we are led to infer, that in equal numbers of wounded in ancient and modern times, the more vigorous constitutions and more simple habits of

the former, as well as the custom of sleeping in the open air, without tents or houses, would greatly tend to prevent the occurrence of such diseases as Erysipelas and Hospital Gangrene; while on the other hand, the scanty supply of suitable materials for dressing and cleansing the wounds, would tend to promote the origin of these diseases, even when the wounded were kept in the open air.

As far as our knowledge of the immense armies of the ancients extends, we are led to believe that they were subject to very much the same forms of fever, bowel affections, and pestilence, generated by the collection of large masses of human beings, which afflict modern armies. Thus we find numerous allusions to the *pestilence* amongst armies, and in beleaguered cities in the sacred writings of the Hebrews; and Homer opens the Iliad with an account of a fatal pestilence in the camp of the Achæans, which sent many gallant souls of heroes to hades, and made their carcasses a prey to dogs and birds of prey. Herodotus relates that during the hasty retreat of Xerxes from Thessaly to the Hellespont, a large portion of his army perished from hunger, dysentery, and pestilence. Pliny, in his "Natural History," refers to a disease, called by medical men, *stomacace* and *sceloturbe*, characterized by loss of the teeth, and total relaxation of the joints of the knees, which afflicted the army of Cæsar in his German campaign, and which from its cause, symptoms, and method of cure, appears to have been the scurvy. This disease appeared in a Roman camp, beyond the river Rhenus, near the sea. The water was brackish, and the only fresh water to be obtained, was from a spring in the vicinity of the sea. The habitual use of this water for two years, caused the loss of the teeth and general debility. A remedy was discovered in the plant known as the *Britannica*, which Spregnel and Desfontaines identify with the Rumex aquaticus, and Fée

with the Inula Britannica, of Linnæus. It is probable that the Romans were not unacquainted with scurvy, and with the best means of preventing this disease; for they are said to have constantly carried vinegar and wine with their fleets and armies, and even the common soldier and sailor daily partook of both. These facts are of interest, for in modern fleets and armies, scurvy has often been associated with the most dangerous forms of Hospital Gangrene. We might multiply these examples by reference to the pestilential fevers which afflicted the Grecian and Roman armies at various times, but our limited space will not permit of farther illustration of the similarity of diseases in ancient and modern armies.

The strongest argument against the ancient existence of Hospital Gangrene, lies in the fact, which is well established by the writings of the Hebrews, of Homer, Herodotus, and many others, that notwithstanding the immense armies of the ancients, and the immense slaughter which took place in their battles, the dead being numbered by tens and even hundreds of thousands, at the same time, there were few or no wounded who survived the immediate conflict. The contending armies of the ancients came to close quarters and engaged in desperate hand to hand fights. In such contests, it was difficult, if not impossible, to remove the wounded from the field of battle; and as soon as an adversary had wounded or disabled his antagonist, he followed up his advantage, and did not desist until his victim was slain and robbed of his armor.

The qualifications of the ancient warrior were very different from those considered essential in modern times. The rigid discipline and mechanical movements of modern armies, appear to have been less practiced, if not unknown in ancient times; and the success of the ancient warrior depended chiefly upon his strength and presence of mind, personal bravery, experience in the use of weapons, bodily

strength and agility. The eye of the ancient warrior acquired an animation, his countenance an expression of fierceness and eagerness, and his voice a power and variety of cadence, and his whole frame a degree of athletic force and energy unknown amongst the comparatively sluggish and mechanical masses of modern armies.

Thus Homer describes the Trojans, as advancing to battle with a clamor and a shout, like the scream of cranes, when flying from winter and excessive rains, they wing their way over the floods of Oceanus, carrying death and destruction to the Pigmies; while the Grecians moved on in silence, breathing forth valor; and as the south wind spreads a mist upon the brow of a mountain, by no means agreeable to the shepherd, but to the robber better than night, in which a man sees as far only as he can cast a stone, so rose the troubled dust under the feet of the hostile hosts, as they rushed across the plain. When Alexander advanced in front of the Trojans, with the skin of a panther on his shoulders, and shaking two brazen spears challenged the chief of the Grecians to mortal combat, Menelaus perceiving his adversary advancing with long strides, rejoiced like a hungry lion, who lights upon a huge carcass, and burning with revenge, leaped from his car to the ground.

Again, in the second meeting of the hostile armies, Homer compares the advance of the columns of the Grecians to the rushing of waves upon a resounding shore, which rising in the deep water, and urged on by the winds, are dashed against the shore, roaring and swelling and curling around the rocks. When advancing on both sides, the armies meet, the spears and bossed shields and brazen corselets are dashed together; the earth flows with blood, and the shriek and the shout of the slaughtering and slaughtered warriors mingle together

as when the torrents of winter rolling down the steep mountain from their vast sources, pour together their foaming waters in some lake, within the hollow glen.

The description by Homer, of the personal conflicts of the individual warriors, still more forcibly illustrates the deadly and ferocious nature of ancient battles, and explains the reason of the disparity between the wounded and the slain. The Grecian Antilochus, was the first who slew a Trojan warrior—his brazen spear struck the cone of the helmet crested with horse hair, and pierced the helmet and bone within. Elephēnor, the leader of the Abantes, seized Echepolus by the feet as he fell, and dragged him from amongst the weapons, that he might plunder him of his armor; but his eager efforts were short, for Agēnor seeing him dragging the body, thrust his brazen spear into his side, which was uncovered by his shield as he stooped. Over the dead body of Elephēnor, the Trojans and Grecians rushed upon each other like wolves, and engaged in deadly strife. Here the Telamonian Ajax, with his spear, struck upon the breast near the right pap, Simœisius, a noble and vigorous youth, and the brazen spear went to the opposite side through the shoulder. Antipus, a son of Priam, then hurled his sharp javelin at Ajax, and missing him wounded Leucus, the comrade of Ulysses, as he was dragging the body of the youthful warrior to the other side, and the body dropped from his hands, and he fell upon it. Then Ulysses, enraged on account of the slain, armed in glittering brass, advanced amongst the foremost combatants, and threw his shining spear, which struck Democoon, a bastard son of Priam, upon the temple, and the brazen point passed through the other temple, and his armor rang upon him as he fell with a crash. Hector and the foremost warriors then giving way, the Argives loudly shouted, dragged away the dead bodies for plunder and rushed forward. After the Trojans

had been rallied by Apollo, who had been looking on from the Citadel of Troy, the battle was renewed with increased fury. Perios the leader of the Thracians, hurled a large rugged stone which struck the right leg of Diores, near the ankle, and crushed the tendons and bones. As Diores fell in the dust, with both hands stretched out to his comrades, Perios rushed upon him, and plunged his spear into his bowels, so that all his entrails gushed out upon the ground. Thoas, the Ætolian, rushed upon Perios, and drove his spear through his breast into his lungs, and jerking the spear from his breast, and drawing his sharp sword, plunged it into his belly, and in turn deprived him of life. But Thoas did not strip his fallen foe of his armor, for the Thracians closing over the dead body, drove him back.

And in a similar manner Homer describes the fierce and bloody contests of many other of the Grecian and Trojan heroes, and has thus given a graphic, and as far as the testimony of other writers extends, a truthful picture of ancient battles.

It appears, therefore, that in the battles of former times, few or no wounded survived, and the prisoners which were captured, were either immediately destroyed or sold as captives. In the wars carried on between the Israelites and the surrounding nations, persons of rank were frequently reduced to the most degrading slavery, some prisoners were put under saws and harrows of iron, and made to pass through the brick kiln, others were beheaded or mutilated in various ways, mothers were murdered with their children, pregnant women were ripped up, and infants were dashed against the stones. And amongst the Romans, prisoners were frequently sold to the infamous schools for gladiators.

The time at which regular army Surgeons were first employed, as well as the date of the establishment of

Hospitals, for the treatment of wounded and sick generally, are points of interest in the discussion of the origin of Hospital Gangrene.

With the Hebrews as well as among the Egyptians, the art of healing was committed chiefly to the Priests. Moses, who was reared in the Court of the Prince of Egypt, and instructed in all the knowledge of the wise men, and of the learned Egyptian Priesthood, has left a most valuable monument to the history of medicine. The writings of this great law-giver and statesman, contain hygienic rules of the highest sagacity designed to regulate not only the intercourse of the sexes, but also to prevent the origin and spread of contagious diseases amongst the hosts of Israel. As the Hebrew Priests accompanied the armies to battle, it is probable that their ministrations to the wounded were of a physical as well as of a spiritual nature. The careful precepts of the Hebrews regarding cleanliness, in all, whether healthy or diseased, as well as the free use of oil and wine on wounded surfaces, would appear to have been eminently calculated to favor the speedy recovery of the wounded, without the supervention of the diseases which so often infest modern Military Hospitals. The instructions of Moses, regarding the signs of the leprosy, and other contagious diseases, and the measures to be adopted to prevent their origin and spread amongst the people, are certainly most accurate and minute. Many of the expressions of the sacred writers, as those of Job, indicate that they were acquainted with unhealthy and even gangrenous sores and wounds; and some of these descriptions would apply with force and accuracy to the severest forms of Hospital Gangrene.

That physicians frequently accompanied and ministered to the leaders of armies, at an early period, may be established by many facts. Thus Homer, in his account of the

wounding of Menelaus by the barbed arrow of Pandarus, represents the King Agamemnon as calling for a Surgeon to probe the wound, and apply medicaments to allay pain. Machaon, son of the famous Æsculapius, who in response to the call of Agamemnon, extracted the arrow, squeezed out the blood, and sprinkled upon the wound soothing medicaments, which Chiron of old had kindly given to his father, is presented by Homer in the light of a warrior and hero, as well as of a Surgeon. According to Plutarch, Alexander the Great was assisted in the study of Physic by Aristotle, and not only loved the theory, but also the practice, and prescribed for his friends medicines and a proper regimen. And it is evident from the account given by the historian, of the illness of the great Conqueror, in Cilicia, supposed to have been caused by bathing in the cold waters of the river Cydnus, that Alexander was accompanied by regularly appointed physicians. The physicians are represented as consulting together, fearing to administer medicine to the King in his dangerous illness, lest in case of a fatal termination, they should be accused of poisoning; and the life of Alexander was said to have been saved by the bold and timely ministrations of Philip the Acarnanian physician. The fears of the physicians appear to have been well-founded, for Alexander himself crucified the physician Glaucus, after the death of Hephæstion, a favorite soldier and officer, who when sick of a fever, took the opportunity whilst Glaucus was gone to the Theatre, to eat a roast fowl and drink a flagon of very cold wine, in consequence of which he grew worse, and died a few days after. It is clear, also, from Herodotus, that Darius kept around him the most learned physicians of foreign countries. Shortly after the overthrow of Orœtes the Persian, Darius in leaping from his horse, while hunting, twisted his foot with such violence that the ankle-joint was dislo-

cated. Thinking that he had about him those of the Egyptians who had the first reputation for skill in the healing art, Darius made use of their assistance; but by twisting the foot and using force, the Egyptian physicians made the evil worse; and the pain was so great that he lay seven days and nights without sleep. On the eighth day, as the King still continued in a distressed state, some one who had before heard of the skill of Democedes the Crotonian, made it known to Darius, who ordered him to be brought as quickly as possible. This physician by using Grecian medicines, and applying lenitives after violent remedies, caused the King to sleep, and in a little time restored him to health, though he had before despaired of ever recovering the use of his foot. The surgical skill of Democedes was still farther attested by the cure of Atossa, daughter of Cyrus and wife of Darius, who had a tumor on her breast, which after some time burst and spread considerably. As long as it was small, she concealed it, and from delicacy informed no one of it; when it became dangerous she sent for Democedes.

It would appear that at a comparatively remote period, the Roman armies were furnished with regularly appointed physicians, with determinate duties. *Medicus cohortes* and *Medicus legionis* are said to appear in ancient inscriptions; and Salmasius, in noticing a passage about an army physician, *exercitus medicus*, in the work of Achilles Tatius, who lived about the third century of the Christian era, says that each cohort had in general a physician. In the sixth century the emperor Mauricius had attached to his army *deputati*, who were distributed amongst the cavalry, and were obliged to carry off their wounded in battle. They had on the left side of the saddle two stirrups, in order that they might more easily take up the wounded behind them; and for every person thus saved they obtained a certain reward. They were also obliged

to carry a bottle of water, for the purpose of reviving those who might have fainted through loss of blood. The emperor Leo VI, in the ninth century, mentions besides the officers necessary for each band or company of a regiment, the deputati, physicians, and attendants on the sick.

We know but little beyond the bare fact that the Roman armies were provided with a medical staff, and little or nothing of the diseases of the sick and wounded soldiers who fell to their care.

The employment of appointed physicians in armies, appears to have fallen into disuse, with the decline of the Roman power; and the first Christian armies of the middle ages appear to have been without any medical organization; the various celebrated physicians who were present at the battles and sieges of those times appear to have served not in an official capacity, as army surgeons, but as soldiers. It was not until the fifteenth century that the attempt was made to furnish some of the European armies with medical organizations. In fact, notwithstanding the efforts of the Germans, and of Henry V, of England, and of Ferdinand and Isabella, of Spain, no very efficient organization was established, until the time of Gustavus Adolphus, who appointed four surgeons to each regiment, which he reduced from the number of two or three thousand, first to twelve hundred, and afterwards to one thousand and eight. We cannot look to the *barber* surgeons, to whom these armies were entrusted, for any very accurate accounts of the various diseases.

As far as our knowledge extends, there were no organizations for the treatment of sick and wounded soldiers and of the sick generally amongst the ancient Greeks and Romans, corresponding to the military and civil hospitals of the present day. When the sick were carried to certain temples, as that of Æsculapius, they received no

special medical attention, and looked to supernatural means entirely for restoration. The view that the *taberna meritoria* was a house or hospital, in which Roman soldiers disabled by wounds, or worn out by the fatigues of war, were received and cared for, does not appear to be well founded. That the Grecians and Romans paid some attention to the welfare of their soldiers, rendered unfit for service, either by wounds or old age, is evident from the fact that Solon deducted something from the pay of soldiers, and employed it for the education of children whose fathers had fallen in battle, in order that others might be encouraged to bravery; Pisistratus made an order that those who had lost any of their limbs in war, should be maintained at the public expense; and many instances may be found, some of which occur in the Justinian and Theodosian codes, of the attention paid by the Romans to their *milites causarii*, who were not only exempted from taxes, but frequently obtained lands, and cattle, and money, and were sometimes assigned over, to be taken care of by rich families and communities.

Hospitals, as well as many other honorable and benevolent institutions, were first introduced by Christianity. In the fifth century, Fabiola, a Roman lady, the friend of St. Jerome, is said to have built one of the first houses for the reception of the indigent sick. As soon as pilgrimages to holy places, and especially to Palestine became customary as a part of religion, it was found necessary to build numerous resting places, in which both the well and the sick might find entertainment. Brotherhoods were formed in the Holy Land, towards the end of the eleventh century, which undertook to provide for the wants of sick and indigent persons, and became richer and more numerous as the Crusades increased. Opulent persons when dying, bequeathed their property to these brotherhoods; and in this manner the hospitals in Palestine were con-

structed on a large scale, and were provided with better accommodations than those in Europe. They were even considered as models, and princes and rich persons returning safe from their pilgrimages caused similar ones to be established in their own countries.

The oldest hospitals, therefore, with the exception perhaps of the institution founded in Persia, by some Nestorian priests as early as the seventh century, were established chiefly under the direction of the clergy, for the convenience and accommodation of the well rather than of the sick; and hospitals exclusively devoted to the treatment of the sick, with appropriate medical officers, were not established until the eleventh century. In fact, in many of the large hospitals, long after the beginning of the eleventh century, there was no regular medical organization, and in the large hospitals of Jerusalem, the knights and brothers attended the sick themselves, and bound up each other's wounds, and exerted themselves to obtain the best balsamic mixtures; and in the houses for the sick, belonging to the order of Templars, the duties of physicians and surgeons were not defined until near the middle of the fifteenth century. Many of the older European hospitals now existing, are said not to date back beyond the seventeenth century, and the Hôtel des Invalides, of Paris, was not commenced until the year 1670, by Louis XIV, and the English hospital at Chelsea was founded by Charles II, in 1682.

From the facts which we have now presented, concerning the mode of warfare of the ancients, the imperfection of their medical knowledge, and of their arrangements for the treatment of the sick of their armies, and the comparatively modern origin of military and civil hospitals, we are justified in the assertion, that the mere absence of special descriptions of this disease in the writings of the ancients, is no proof that Hospital Gangrene is not a

disease of great antiquity. The essential conditions for the origin and spread of this disease were frequently present in ancient times.

Pliny, in that portion of his Natural History which treats of the remedies derived from plants and animals, has mentioned various ulcers; as phagedæna, which he describes as an ulcer of the *corrosive* kind; malignant ulcer cacœthes; serpiginous ulcers, the cure of which, Pliny considers more than doubtful; corrosive sores; putrid sores; callossities or putrid sores; corrosive sores known as *nomæ;* defluxions; aposthemes; sordid ulcers; suppurations; abscesses; fistulous ulcers and gangrenes; also, contused and incised wounds, and simple and compound fractures. Pliny also recommends various remedies, as the juice of the Tilhymalos Characias, bull's gall, leek juice, woman's milk, bull's blood dried and pounded with the plant Cotyledon, and ashes of cow's hide mixed with honey, for the cure of gangrenous, phagedænic sores, and putrid ulcers.

Mr. Blackadder has shown in his "Observations on Phagedæna Gangrænosa," that several of the ancients in their descriptions of foul gangrenous bleeding ulcers, must have alluded to the same kind of disease, which is now usually denominated Hospital Gangrene. Besides the use of the actual cautery, several of the old writers, as Ætius, Paulus, Rolandus, Avicenna, Guido, and others, appear to have employed for the cure of such ulcers, arsenical applications.

Parée, more than two hundred and fifty years ago, says that, in siege of Rouen, the air was so noxious that no wound healed; and the besieged, finding that all their wounds became gangrenous, reported that the besiegers had poisoned their balls; the besiegers, also, seeing none but putrid sores in the camp, believed that their wounds were poisoned; and both within and without the city,

such was the state of the air, and so putrid were all the wounds, that the surgeons could scarcely look upon the sores, or endure the smell; and if they neglected them for a single day, they found them full of worms. Parée complained that in the Hotel Dieu, sores would not heal, and no operations could be rightly performed. And, after him, Diorus, more than one hundred and fifty years ago, protested against performing operations in the Hotel Dieu; and advised that an hospital should be built in the environs of the city, for those who were wounded or required operations. And other army surgeons of former times have remarked, that in some seasons, those wounded in battle, and those operated upon became afflicted with gangrene; and however trifling the wounds at first sight might be, the patients usually fell victims to the gangrenous affections which ensued. Lamotte, in 1722, mentions Hospital Gangrene as being known in the Hotel Dieu, of Paris, by the name of La Pourriture, and as a disease which attacked the wounds inflicted by operations, and the ulcers and abscesses of those who breathed the corrupted air of this hospital.

The first description of Hospital Gangrene, as a distinct disease, appeared in 1783, in the third volume of the posthumous works of M. Pouteau, chief surgeon to the Hotel Dieu, of Lyons. The attention of this author was directed to the disease, by having been himself affected with it while employed as dresser in the hospital. M. Dussassois, the successor of Pouteau, in the same hospital, published in 1788, an account of this disease in a pamphlet of about ninety pages. This was followed shortly after, in 1796, by a small pamphlet upon this disease, by Moreau and Burdin. According to Dr. John Thomson, who published near fifty years ago, a valuable chapter on "Hospital Gangrene or malignant ulcer," in his "Lectures on Inflammation," the first accurate account

of this disease published in the English language, appeared in the sixth volume of the London Medical Journal, in 1785, and was entitled "Observations on the Putrid ulcer, by Leonard Gillespie, surgeon of the Royal Navy." Dr. Thomson regards the sore described by Dr. Rollo, in his work on Diabetes published in 1797, in the section, "A short Account of a Morbid Poison, acting on sores, and of the Method of Destroying it," as one and the same disease with Hospital Gangrene.

Various writers have recorded observations upon Hospital Gangrene, as:

Pouteau, Œuvres Posthumes, vol iii: 1783; 8vo. Gillespie, Observations on the Putrid Ulcer, in London Medical Journal, vol vi: p 373; 1785. Dussaussoy, Sur la Gangrène des Hôpitaux: Geneve; 1787. Sir Gilbert Blane, Observations on the Diseases of Seamen: third ed., London; 1799. Thomas Trotter, Medicina Nautica—An Essay on the Diseases of Seamen; 1799. John Hunter, physician to the army, Observations on the diseases of the army of Jamaica: 1796, chap vi, of sores and ulcers; p 221. Thomas Clark, Observation on the nature and cure of fevers, and of the diseases of the West and East Indies, and of America: 1801; p 118. John Bell, Discoveries on the nature and cure of wounds, 2d ed.: 1800; vol 1, p 244. Principles of Surgery, vol 1, 1801. Wolf Ploucquet, De Gangrænâ sic dicta Nosocomiorum: 1802. Leslie, De Gangrænâ Contagiosâ Nosocomiale: Edinburgh; 1805. John Burns, Dissertations on Inflammation: discourses iii and iv, on the Phagadænic and some other species of Inflammation. Evard Home, Practical observations on the treatment of ulcers of the legs, etc. John Thompson, Lectures on Inflammation: 1813; chap on Hosp. Gan. or malig. ulcer. Renard, über den Hospitalbrand: Mairz; 1815. Delpech, Mémoire sur la Complication des Plaies et des Ulcéres connue sous le nom de Pourriture d' Hôpital: 1815. Delpech, Clinique Chi

rurgicale de Montpellier: vol i, p 78. Gerson, über den Hospitalbrand, nach eigenen Erfahrungen: Hamburg; 1817. Dr. Hennen, London Medical Repository: March; 1815. Professor Burgman, of Leyden, Annales de Littérature Med.: vol 19; 1815. Blackadder, Observations on Phagedæna Gangrenosa: 1818. Hennen, Military Surgery. Samuel Cooper, Dictionary of Practical Surgery: art. Hospital Gangrene. C. J. M. Langenbeck, Neue. Bibl. 2 B: p 611, etc.,; 1820. Brugmans und Delpech, über den Hospitalbrand, übersezt mit Anmerkungen und Anhang Von Kieser, Jennal; 1815. Boyer, Traité des Maladies, Chir. T. i, p 320: Paris; 1814. Sketches of the Medical Schools of Paris, by J. Cross: p 82; 1815. Baron Larrey's Memoirs of Military Surgery. W. Werneck, kurzegefasste Beiträge zur Kenntniss der Natur, du Entstehung, der verhurtung und Heilung des Hospitalbrandes: Salzburg; 1820. Brauer, Observationes quædam de Gangrænâ Nosocomiali quæ anno-hujus Sæculi, xiv, Lipsiæ inter milites variarum nationum grassata est: Lipsiæ; 1820. Alexander, über den Hospitalbrand in Hippocrates Magazin, von Sander und Waepter: vol v, p 1–220. Boggie, in the Transactions of the Medico-Chirurgical Society of Edinburgh: vol iii, p 1; 1828. Olliver, Traité experimental du Typhus Tràumatique Gangrène ou Pourriture des hôpitaux: Paris; 1822. Guthrie, Treatise on gunshot wounds. Benjamin C. Brodie, Clinical Lectures on Surgery. Macleod, Notes on the Surgery of the War in the Crimea. Medical and Surgical History of the British Army, which served in Turkey and the Crimea, during the war against Russia, 1854–56, 2 vols.: London; 1858.

Observations on Hospital Gangrene occur, also, in the various systematic treatises on Surgery, and in the numerous medical journals of Europe and America, under the head of Phagedæna, Putrid or Malignant Ulcer, Hospital Gangrene, Hospital Sore, Gangræna Contagiosa.

REVIEWS.

ARTICLE I.

An Anatomical Controversy. The Distribution of Nerves to Voluntary Muscle, including the Discussion of the following Questions: Do Nerves Terminate in Free ends? Or do they invariably form circuits and never end? By LIONEL S. BEALE, M. D., F. R. S., Fellow of the Royal College of Physicians; Physician to Kings College Hospital; Professor of Physiology and of General and Morbid Anatomy in Kings College, London. (Reprinted from the Archives of Medicine. London: John Churchill and Sons, 1865; p. 38. Plates 6.)

The author of this "Anatomical Controversy," is well known to the profession by his works "On Some Points in the Anatomy of the Liver of Man and Vertebrate Animals, with Directions for Injecting the Hepatic Ducts, and making preparations;" "The Microscope and its application to Clinical Medicine," and by his various papers upon the minute anatomy of certain organs, published in the "Archives of Medicine."

In a paper upon the distribution of nerves to the voluntary muscle of vertebrate animals, published in the Philosophical Transactions of 1860, p. 611, Dr Beale arrived at conclusions which were opposed to the views entertained by most authorities, especially Kölliker, Gerlach, and Kühne. This paper was followed by a communication from Kühne, in which he supported, by investigations upon the breast muscle of the frog, conclusions advanced by him previous to the publication of Dr. Beale's paper, in favor of the view, that the nerves in insect muscle terminate in ends beneath the sarcolemma, and are in fact, continuous with rows of nuclei which lie among the contractile tissue.

Kölliker, a month after Kühne's paper appeared, put forward a memoir in which he agreed with Kühne as to the termination of the nerves by ends, but with Beale as to the fine nerve fibres being upon or external to the sarcolemma, instead of penetrating through this membrane and coming in contact with the contractile tissue.

Here then are three utterly incompatible inferences with reference to the termination of the nerves: 1. That the nerves terminate in ends external to the sarcolemma; 2. That the nerves

terminate in ends beneath the sarcolemma; 3. That the nerves do not terminate at all. It might be said that all are wrong; but it is an absolute necessity that two are wrong, since no two of the preceding arrangements can coexist.

Notwithstanding the appearance of many new memoirs upon this subject in 1862, 1863, and 1864, the views of which as a general rule differ from those of Dr. Beale; this microscopist does not yield; "for the simple reason that I have seen what I have figured, and have indeed found no difficulty in following fine fibres structurally continuous with dark-bordered fibres for a long distance beyond the point where Kühne, Kölliker, and others, make them end. Moreover, my specimens show the arteries and capillaries as well as the nerves, and I have now worked at this anatomical point so long and so hard that I have a right to ask that my opponents should prepare the specimens by the same process that I have followed, and give drawings of what they observe. I would then reply by giving drawings of the very same structure, showing what I have seen. Independent observers would then be in a position to judge between my opponents and myself." We consider this proposition of Dr. Beale as just, and as calculated to settle definitely some of the most difficult and important questions in anatomy and physiology.

Our knowledge of the minute anatomy of many organs, is at present, by no means as perfect as we have every reason to believe that it will be in the future, by the aid of the improved instruments and methods of microscopical research. Up to a comparatively recent period, the methods of preparation, as well as the character of the optical instruments employed, were unsuited to the accurate determination of the mode of distribution of the nervous fibres, in such structures as the papillae and tactile bodies of the skin, in the Pacinian bodies, in the retina and cochlea, and in the mucus membrane of the nose and mouth. Thus Geber in his efforts to determine the ultimate distribution of the cutaneous nerves, overcame the opacity of the cutaneous tissue of man and quadrupeds, by boiling portions of skin, and then steeping them in oil of turpentine, until they were rendered transparent; and Krause in similar investigations, treated the skin with nitric acid;

and many of these violent modes of boiling and coagulating and metamorphosing and coloring with strong chemical re-agents, are still used in microscopical investigations, into pathological as well as anatomical or normal structures.

In all future anatomical discussions, of difficult questions, the method of preparation as well as the power and character of the instruments employed, should be so fully and emphatically stated that the observations may be repeated and the drawings subjected to that critical scrutiny which the importance of the subject demands.

We look with great expectations to the application of the art of photography to the correct representation of the minute anatomy of structures. Whilst it is true, that no mere photograph can ever convey the knowledge acquired by patient and intelligent microscopical investigation of delicate structures viewed in thousands of varying attitudes and lights; at the same time the photograph when perfect, will tend to correct those regular diagrams so beautifully executed by some anatomical artists, and will also tend to expose the errors of those who are able to make the anatomical structures which they delineate, correspond exactly to the pre-existing theories of their minds.

In the paper now under consideration, Dr. Beale claims that he has demonstrated:

That the nerve fibres passing to a muscle, divide at length into a vast number of exceedingly fine, pale granular fibres, which ramify upon the external surface of the sarcolemma, connected with which fibres at certain intervals, are oval nuclei, and that these fine fibres, after an extensive and in many cases very circuitous course are continuous with other fibres to form dark bordered fibres, which at length pass *toward* the nervous centre, either in the same bundle as the dark-bordered fibres passing toward the muscle, or in other bundles.

It therefore follows, that of the dark-bordered nerve fibres distributed to a muscle, some pass from the nervous centre toward the muscle, some from the muscle toward the nervous centre, and that the nerve fibres *do not end* in the muscle at all. The results of these researches considered in connection with those arrived at

from the investigation of various kinds of nerve centres, justify the inference that the fundamental arrangement of a nervous apparatus, is a complete and continuous circuit. These observations of Dr. Beale, the importance of which cannot be overestimated, as they involve the typical arrangement of every nervous instrument, show therefore, that so far from their being distinct ends to nerves, that in all cases complete circuits exist; and that in these circuits are included *central nerve cells,* and *peripheral nerve cells* generally termed nuclei, which are connected by intervening fibres. The course of any given fibre may be extremely complicated, and there may be many minor circuits connected with the greater one, but in all cases there is a circuit —a nerve never ends.

The importance of these results are seen in a clear light, when we attempt to apply them to the explanation of certain nervous diseases.

Thus if we attempt to apply these anatomical facts to the explanation of Traumatic Tetanus, we observe—

1st. The nerves in their ultimate branches and ramifications, form a network of great complexity and of immense extent.

2d. Within this extended network, and connected by both efferent and afferent nerves, with the central ganglia, are potential elements, true nerve-force generating cells.

3d. A local injury or irritation is capable of producing a state of super-functional activity in the nerve cells of the periphery of the sensative and motor nerves. As these nerve cells exist in immense numbers even in comparatively small portions of structure, and as they are within the same closed circuit with the nerve cells of the gray matter of the cerebro-spinal axis, a state of super-functional activity or of irritation, might be readily transmitted from the periphery to the central ganglia. Thus a local nervous exaltation of nervous function in the peripheral ganglionic nuclei, is capable of propagating itself, first to the nervous cells included in its own peculiar circuit, and from these latter, through the channels of intercommunication, to the various segments of the spinal axis.

It is but right that we should add, that in the preceding observations, and in our application of the results of the labors of Dr. Beale to the explanation of the phenomena of Tetanus, we do not at all claim for Dr. Beale the discovery of the formation of extensive networks in the peripheral fibres of the nerves, and the reunion of the ultimate fibres composing the networks, into nerves which return to the central ganglionic masses.

Thus Valentin, Burdach, and other observers, represent the nervous fibres distributed to the skin of the frog, as dividing into numerous small fibres, and forming a close anastimosing network, which does not end in the tissue, but after coursing for a longer or shorter way, returns sooner or later, to the larger branches of the nerves. Schwann observed that the nerves in the web or fin of the tadpole's tail, and in the mesentery of amphibia, divide into numerous fine fibres destitute of the white substance, without any dark outline, and presenting little enlargements from whence delicate fibres spread out in various directions, and connect themselves in the form of a delicate and extensive network. The subsequent observations of Quain confirmed those of Schwann, and also showed that the smallest nerve fibres presented here and there along their course, elongated corpuscles, like cell nuclei. The researches of Rudolph Wagner, upon the distribution of the nerves of the electrical organs of fishes, in like manner establish the doctrine that the peripheral nerve fibres divide and subdivide, and reunite, and are distributed in a plexiform manner, like the ramification of the capillaries. Here Bilharz has shown that the small nerve which supplies the electrical organ of the electrical Silurus (Malapterurus), keeps continually dividing, until it finally resolves itself into an enormously great number of ramifications, which spread themselves out upon the electrical organ, thus allowing of the sudden diffusion of the nervous influence over the whole extent of the electrical plates. The investigations of Meissner and Billroth have shown that the submucous layer of the intestines, is as Willis had long before declared it to be, a nervous tunic. The afferent nerves of the intestine, after having divided, finally break up into extensive networks, presenting at certain points, nodules having the appearance of ganglions, from which

the nerve fibres spread out into interlacements like the network of capillaries.

This arrangement not only enables us to understand the nature of peristaltic action; but it also offers a groundwork for the explanation of Tetanic spasms, and convulsive affections arising from irritating substances in the alimentary canal, similar to that afforded by the distribution of nerve fibres to involuntary muscles.

We are enabled by such facts to understand how a local irritation may excite super-functional activity in the adjacent nervous centres, and these in virtue of their communications with other nerve centres may extend the influence over larger tracts of the intestines, and the excitation may also extend to the central sympathetic ganglia, and from thence be reflected upon the spinal axis.

Such physiological applications as we have made of these investigations, do not appear to have suggested themselves to the mind of Dr. Beale, or to the other observers to whose labors we have referred.

The tendency of the more careful investigations, appear to be, the establishment of the peripheral division and expansion of the nerves into extensive networks, or of their direct connection with special apparatuses, as in the retina of the eye.

The plates illustrating this "Anatomical Controversy," executed by Dr. Beale from nature, combine clearness, finish and beauty, and certainly most forcibly illustrate the views of the author, and present a striking contrast to the more confused and rude diagrams of Kühne and Kölliker, which are presented by Dr. Beale for purposes of reference.

ARTICLE II.

Hygienic Experience in New Orleans during the War: Illustrating the Importance of Efficient Sanitary Regulations. By ELISHA HARRIS, M. D. (From Bulletin of the New York Academy of Medicine, No. 30: September; 1865.

All facts relating to the origin, causes, and means of prevention of yellow fever, are of vital importance to the inhabitants of the Southern cities. A correct knowledge of the laws which govern yellow fever, and all other diseases, can be

obtained only by the accumulation of a large number of well observed and undoubted facts. Those who are instrumental in the discovery and establishment of the laws which govern the origin and spread of so great a scourge as yellow fever, should surely be considered as honored and useful instruments in the hands of Providence. The author of the observations now under consideration, is well known for his devoted and untiring labors in the cause of sanitary science, and his testimony, therefore, upon this or any other subject of hygienic experience, is entitled to the confidence and respectful consideration of the medical profession.

The personal inquiries of Dr. Harris in the city of New Orleans, were made during the month of July, 1865, while pursuing certain investigations relating to the hygienic experience of the military forces.

As these notes upon the civic hygiene of that important military district were submitted to the Academy of Medicine, without any attempt to present an exhaustive statement, we shall limit the present review to a bare presentation, in the language of the author, of those facts which are of the greatest interest in their bearing upon the sanitary regulations of cities subject to yellow fever.

Shortly after the occupation of New Orleans by the United States' forces, the most stringent sanitary regulations were promulgated (May 1st, 1862), and an efficient sanitary police established.

"Throughout the entire period, upwards of two years, the Provost Marshal, the Military Governor, the Mayor (an appointee of the provisional government), together with the Medical Director of the post, and certain subordinate health officers, have vigilantly administered the regulations relating to municipal hygiene and cleanliness in New Orleans and its vicinity. During all that period the accustomed scourgings of yellow fever have been suspended in that city, while the dire forebodings and prophecies of the inevitable pestilence that would quickly destroy the Northern soldiery on reaching the Gulf coast, remain unrealized. The conditions under which the "Crescent City" has obtained

this remarkable immunity from a doom which her own bitter experience seemed to fasten upon her, are now as well understood as were the apparently inexorable causes of her former insalubrity.

Such immunity from her accustomed scourging of yellow fever had not been enjoyed by New Orleans the last half century. Even her wisest hygienists had been generally discredited and often derided when they publicly taught, as Fenner, Barton, Simonds, and Bennett Dowler had most faithfully, that the active and localizing causes of yellow fever and the high death-rate in that city were preventable. There was a truthfulness worthy of the medical profession in the words of Dr. Barton, who, as President of the New Orleans Sanitary Commission, sitting in grave and scientific consultation upon the terrible visitations of yellow fever, unhesitatingly declared the causes of that pestilence and the city's excessive insalubrity '*entirely susceptible of cure.*' But how few persons appreciated the truth of Dr. Barton's words of prophecy, when he said that 'upon the broad foundation of SANITARY MEASURES we can erect a monument of public health, and that if a beacon light be erected on its top, and kept alive by proper attention, this city will be second to none in this first of earthly blessings.'

It is the design of the following notes to show what have constituted the chief causes of insalubrity in New Orleans, and by what means the redemption from its fearful doom has been achieved. In doing this it will be shown that for two successive years the threatening pestilence was localized in a fleet of gunboats moored so close to the city levées that they menaced the streets with death. It will likewise appear that, by the exercise of absolute and relentless military authority, an impregnable system of quarantine was maintained, restraining all the exotic causes of yellow fever, and controlling such causes at a distance of nearly seventy miles from the city; and yet that this dreaded scourge originated spontaneously in more than twenty of the gunboats that were moored in the river opposite the city; also that those naval vessels were uniformly filthy, ill-ventilated, and overcrowded; that of the more active, cleanly, and less crowded

steamboats (120 in number) employed in quartermaster's service, no yellow fever occurred; that in all the city not more than three or four cases of yellow fever occurred each year, and that the cause of such immunity from the pestilence of former years was as certainly the direct result of civic *cleanliness* and the hygienic care of the poor, as its accustomed visitations were the result of neglect of these public duties.

Three classes of facts, concerning which neither doubt nor uncertainty can be alleged, have conspired to give precise relations and definite value to the series of events we are about to consider: *First.*—The relentless rigor and precision of a military government precluded the ordinary violations of quarantine regulations, while it gave peculiar certainty to the execution of sanitary regulations in the city. *Second.*—The official usages and the armed discipline of the naval fleet in the harbor of New Orleans and upon the river, enabled the medical officers to trace to its source every case of yellow fever that occurred in the gunboats. *Third.*—That the climate of the city and of the river districts, during the past three years, was not perceptibly different from the climate of previous years and the periods of yellow fever epidemics; the same evils from imperfect culture and drainage, imperfact levées, and extensive crevasses, flooding and subsequent evaporation from vast areas of overflowed land, continued to recur in the latter as in former years. In short, all the physical conditions that are supposed to promote the prevalence of yellow fever—excepting only such as are immediately controllable by a sanitary police—prevailed continually and abundantly in the delta of the Mississippi during this period of immunity from that disease.

The Sanitary History of New Orleans before the War.—Constantly recurring epidemics of pestilential diseases had for two generations seemed to pronounce the doom of the Crescent City, and, notwithstanding the vast interests of commerce, there have been dismal forebodings of inevitable decadence of wealth and commerce. Between the years 1829 and 1852 inclusive, there were not less than *twelve* great epidemics of yellow fever, or one every second year. Those twelve epidemics killed 22,884 inhabitants, or an average of 1907 in each epidemic, which gives an

average of 888 persons killed by that fever, year by year. As the fever prevailed to some extent almost every year, the actual average each year reached about 1,000 persons.

During the epidemic years the average death-rate, from all causes, was nearly 75 deaths to the 1,000 inhabitants. The average annual death-rate during all that period, and up to the year 1861, was about *six and a half per cent.* There were years when the death-rate exceeded ten per cent.

Fresh immigration of Northern or foreign born persons was always accredited as the chief source of any excessive mortality; and to become *creolized* (naturalized to the climate) was esteemed almost equivalent to a limited life assurance policy. But we have now seen that during the period of military occupation by the national troops, a hundred thousand Northern men, uncreolized and unacclimated, have annually arrived in or passed through that city without a single individual being smitten with yellow fever, except in a few instances in which soldiers *detailed* to assist at the boats on the levee in receiving and conveying yellow-fever patients to the Naval Hospital on New Levee and Erato streets.

The Summers of 1862, 1863, 1864, and 1865 have now passed without any sign of epidemic disease, except from paludal malaria being manifested at New Orleans, save only the outbreak of small pox last Winter. That epidemic was at once controlled by a house-to-house visitation by a corps of medical inspectors, armed with vaccine virus.

Malarial fever and the ordinary diseases of the climate, not dependent upon a medical police, continued to prevail, but the diarrhœal and infantile maladies were less fatal than in former years. The following statistics of mortality for the six weeks that are usually the most unhealthful of the year, show how the "hygienic barometer" stood during the Summers of 1863 and 1865—the periods when the largest numbers of Northern men and unacclimatized persons were in that city. For the Summer of 1863 the records stand thus:—

	No. of Deaths.
During the week ending August 2	169
During the week ending August 9	176
During the week ending August 16	166
During the week ending August 23	139
During the week ending August 30	161
During the week ending September 6	145
During the week ending September 13	203

During the seven weeks of the past Summer (1865), of which we have received official returns, the records read as follows:—

	No. of Deaths.*
During the week ending July 2	155
During the week ending July 9	154
During the week ending July 16	155
During the week ending July 23	165
During the week ending July 30	174
During the week ending August 6	144
During the week ending August 13	168
During the week ending August 22	170
During the week ending August 27	141
During the week ending September 5	149
During the week ending September 10	116

New York cannot boast a lower death-rate for the same period. The total number of deaths in July was 793, and in August just past, the number was but 623. Compare this with the mortality in that city in August, 1853, when 6,201 of the inhabitants died! Or compare with the average mortality of the three years, 1853, 1854, and 1855, which gave more than 1,000 deaths per month, though the population was far less than during the past summer.

It cannot be claimed that there have been any favoring circumstances in the seasons, the dryness, or the humidity, that can account for such hygienic changes. During the past three years the levees have been cut and *crevassed*, and the country overflowed, as at no former period; and then, in August last, for example, the swampy surfaces surrounding the city were desiccated, *less than a single inch* of rain having fallen that month; while in the early part of the present month (September), as in the months of Spring and Summer, floods have descended. Now, from the sanitary officers of the city we learn that diseases and mortality have been chiefly diminished in connection with the abatement of those local conditions that are recognised as the *localizing causes.* These causes, in the language of Dr. E. H. Barton, consisted mainly in—

'1. Bad air.

'2. Offensive privies, cemeteries, various manufactories, stables, slaughter-houses, filthy streets, etc.

'3. Bad water, stagnant water, bad drainage.'

These were the causes of disease first noticed and officially controlled by the military government under the national forces.

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*The total population, including the permanent or the transient military forces, was little less than 200,000.

The Appliances and Means of Sanitary Reform.—1. The streets, the courts, the market-places, and all the private and public premises of the city have been cleansed and kept in a state of unusual cleanliness by an absolute authority.

2. The drainage of the city was a matter of constant official concern, and the steam-drainage works kept in great activity night and day. [As all the drainage is superficial, by gutters, ditches, and canals, the mechanical appliances for drainage, located at the junctions of canals and bayous leading toward Pontchartrain, maintain an important relation to civic purity and the public health. Some of the water-lifting machines exhaust from the canals and basins at the rate of more than 100,000 cubic feet per minute, raising the sewage from the lowest levels of the town, and sending it forward toward Lake Pontchartrain by way of the bayous] During the frequent rain-falls, when the water floods the gutters and covers whole streets, cleaners are seen at work with hoes and stiff brooms adding the effectiveness of their arms to the process of cleansing by water-flushing.

3. The water-supply, which is wholly from the river, was, from the beginning of the military government, a matter of first-rate importance. Though the river surface is higher than the plane of the city, the supply depends mainly upon steam pumps and reservoirs. The pumps were ordered to be kept in the highest activity, and the water company was held accountable for any failure in its works.

4. Street-cleaning was literally a *cleansing;* the faithful broom was immediately and all night long, as constantly as night returned, succeeded by a flushing stream of water from the hydrants, filling and flushing gutters and the pavement-joints, and, aided by the sleepless sweepers, thus rendering the Augean work complete. So clean a city had never before been seen upon the continent.

5. Scavenging and domiciliary hygiene were enforced by order of the Provost-Marshal. Privies and garbage, stables and butcheries, damp and unventilated quarters, and the haunts of vice and debauchery, were all brought under police control. The privies in populous streets, and those connected with places of public resort, were sometimes cleansed as frequently as twice each week.

All animals for the markets were impounded at the outskirts of the city, and the cattle-boats were there scrubbed and cleansed before proceeding down to the commercial levees. And as an illustration of the salutary exercise of authority over improper habitations, the writer would mention that he saw all the tenements upon the first floor of an entire block vacated by peremptory orders in a single day.

6. The destitute were supplied with wholesome food at the expense of the city.

Such were the leading features of the sanitary government of the Crescent City under military rule. The errors of that government, and the criticisms it may have provoked, were neither the cause nor consequence of the protection it gave to life and health. All the acts that related directly to the public health can be repeated in any city, and by any enlightened civil government.

Quarantine.—Perhaps there has never been a more enlightened and faithful exercise of regulations in the nature of quarantine than has been witnessed at New Orleans the past four years. Yellow fever and small pox were the only infections feared or guarded against. All the exotic and transportable causes or *fomites* of these maladies were detained at the quarantine anchorage, sixty five miles down the river, near Fort Philip.

Shall we be told that it was by this very application of a judicious and inviolable quarantine that the city escaped the epidemic visitations of disease? We have seen that small pox appeared as a wide-spread epidemic, and that it was checked by a house-to-house visitation of a medical police armed with vaccine virus!

Yellow Fever.—This disease did not become epidemic in the city. Nearly three and a half years have passed without so many as a score of sporadic cases occurring in the streets where that enemy and pest of the city had been wont to destroy its thousand victims every year, and sometimes to kill no less than *five thousand* in a single month!

As the writer's views concerning the *transportability* and the infectious nature of yellow fever are already well known to the Academy, the following statement regarding yellow fever and

quarantine at New Orleans will not require explanation as respects the stand-point from which he has examined the facts. With the peculiar and abundant experience of yellow fever in the ports of the North fresh in mind, the history of this malady at New Orleans and in our naval fleet on the Mississippi was investigated with all the predilections which such experience could justly impart in favor of the theory of the exotic and imported origin of the disease.

Well-marked and fatal cases of yellow fever occurred in New Orleans in the Autumn of 1863, and in the Autumn of 1864. In the former year the Charity Hospital received two cases, both of which proved fatal. Both were boat hands from the steamer J. H. Hancock, a river tug. In 1864 there were five undoubted and fatal cases of yellow fever, terminating in black vomit. The writer conversed with the physicians who attended these patients, viz.: Professor Crawcour, Dr. Bennett Dowler, and Dr. Smythe; and Dr. Huard has furnished notes of a case that occurred in the parish prison. These five cases occurred in persons who resided or daily visited in the vicinity of Erato, Tchapitoulas, and New Levee streets. They were exposed to known causes of the fever. Other cases may have occurred; if so, they have eluded all search.

We have referred to the two cases from a tug in the river, in the Autumn of 1863. Nearly 100 other cases of the fever occurred in the river fleet and in the Naval Hospital that season. The history of all these cases, in detail, shows that they were not of imported origin. They nearly all occurred in crowded, filthy, and unventilated gunboats that were at anchor in the river at New Orleans. Owing to the inaccessibility of medical officers who had charge of some of the patients, the tabulated history of these cases gives way, in this place, to the more complete records of yellow fever in the Autumn of 1864.

We have mentioned the five cases of black vomit that occurred near New Levee street, in 1864. The Naval Hospital occupies a large pile of old buildings on that street, with yards and accessory buildings toward Erato and Tchapitoulas streets. One block of buildings—storehouses—intervenes between the Hospital and the river levee and landings. The accompanying record of yellow

fever in that Hospital and in the idle gunboats in the stream, sufficiently accounts for the concentration of infection in the particular locality in which the five cases occurred outside of the Hospital premises. Other cases occurred, but they were directly dependent on intercourse with the infected vessels, and the bedding brought from those vessels.

The fact, then, is indisputable, that yellow fever visited twenty-five vessels in the fleet that was anchored in the river in front of New Orleans during the Summer of 1864, and that the disease appeared first, viz.: as early as September 12th, in vessels that had been for a long time at anchor there. The brief notes here appended supply the best commentary we could wish. Filthiness, crowding, excessive heat and moisture, lack of ventilation, and the stagnation incident to anchorage in a tideless stream, constitute the leading facts relating to the infected vessels.

To test the merit of this view of the *spontaneous origin* of the fever, the writer has obtained the written history of every case of which any note was made at the Naval Hospital and elsewhere. He also obtained from the quartermaster in charge of water transportation, a record of the 120 steamers and sailing-vessels that were under his control. Of these *active* vessels, only one had yellow fever on board. That these ordinary mercantile and transport vessels under control of the quartermaster were open, ventilated, and moving briskly about from place to place, yet infinitely more exposed to all sources of exotic infection, is the only comment this point in our record requires.

Our records show that not less than 191 cases of yellow fever occurred on board the twenty-five vessels we have mentioned in the fleet at New Orleans, in the year 1864; and that of these, fifty-seven proved fatal. Also, that in addition to these, there were twelve cases and three deaths among employees and guard at the Naval Hospital and landing on Erato street. Five other cases of black vomit occurred in citizens exposed to the same cause in the vicinity of the landing. The total number of cases was 208, and the total deaths 65. At the Quarantine station no other cases or vessels than those mentioned in our record were seen in 1864; and from July 4th, 1863, to September 10th, 1865,

only twenty-three deaths from yellow fever occurred, and only one vessel, besides those we have here designated, brought cases of the fever to the Quarantine station—that, a Spanish war ship, in 1863.

The hygienic lessons taught by the events to which these notes refer, abundantly vindicate the principles and the methods of sanitary improvement which are advocated by the medical profession. These lessons may be entitled as follows :—

1. The insalubrious circumstances that produce a constantly high death-rate, and the localizing causes of disease generally, are the most important and the most preventable causes of the epidemics that afflict cities.

2. That the climate and the topographical disadvantages which have hitherto been popularly supposed to be the essential causes of the insalubrity of New Orleans, are but unimportant factors of insalubrity, which sink into insignificance when the preventable causes of disease in the city are controlled, and that "vanquished Nature yields its empire to man, who creates a climate for himself."

3. That yellow fever, the most dreaded scourge of New Orleans, was unequivocally generated in a large number of filthy and unventilated gunboats and other naval vessels lying idly at anchor within a mile from the densest portions of the city.

4. That by fomites, or some other material agency, the infection of yellow fever was communicated to the guard, and to certain other persons who were exposed in a narrow district, at the Naval Hospital landing in Erato street, and near New Levee and Tchapitoulas streets.

5. That the infected vessels were remarkably close in their exterior construction; that they discharged no cargoes; were under an armed surveillance and discipline; and were seemingly incapable, from these circumstances, of diffusing their own infection, except by the clothing and "dunnage" of the sick when taken ashore.

6. That vessels and river boats of ordinary construction and in active service, escaped yellow fever almost without exception.

7. That no vessel infected with yellow fever, arriving by way of the Gulf of Mexico, was allowed to pass above the Quarantine station—65 miles from the city.

8. That the utility of a rational quarantine system against the fomites of yellow fever was not disproved, but the contrary rather, by the records studied by the writer at New Orleans.

9. That an epidemic of small-pox was promptly arrested by house-to-house vaccination.

10. That with the prevention of epidemics, and unquestionably by the same agencies of prevention generally, the death rate from zymotic diseases as a class has been very greatly diminished."

ARTICLE III.

A Treatise on Military Surgery and Hygiene. By FRANK H. HAMILTON, M. D., etc. Illustrated with 127 Engravings: 8vo.; 650 p. New York: Bailliere Brothers, 1865.

Professor Hamilton, already favorably known to the profession as the author of a most valuable treatise on Fractures and Dislocations, published at the beginning of our late war a "Practical Treatise on Military Surgery" to supply the immediate wants of young Surgeons entering the army service. He tells us that "the edition was soon exhausted; but unremitting engagements in the public service prevented a revision of its pages, and the republication was consequently delayed. Having at length undertaken the revisal, it was found that four years of war had opened so many questions of interest, that the limits and scope of the original volume were inadequate to their consideration; and instead of a new edition, an entirely new work was demanded." The work before us, therefore, embodies his perfected labor, and fully sustains the high reputation he had before acquired as a writer and teacher in Bellevue Medical College and Hospital.

In order to present a general view of the scope of this work, it is only necessary to state that it treats of the Examination of recruits; General Hygiene of troops; Bivouac, accommodation of troops in tents, barracks, billets, huts, etc.; Hospitals; Preparations for the field; Hygienic management of troops upon the march; Conveyance of sick

and wounded soldiers; Gun-shot Wounds; Punctured and Incised Wounds; Gun-shot Fractures; Amputations; Exsections, Arrow Wounds; Traumatic Gangrene; Dry Gangrene; Tetanus; Scorbutus; and the employment of Anæsthetics. Our limits will not permit us to examine each of these topics, but we shall cite a few paragraphs in illustration of some of the author's views.

In describing some of the probes used in the examination of Gun-shot wounds, the following brief account of Nelaton's neat little invention is given: "The probe of Nelaton is often invaluable in determining whether the foreign body, the presence of which the ordinary silver probe may have discovered, is lead or bone. This instrument is a small ball of unpolished porcelain fastened securely upon the end of a probe. Its size may be conveniently varied from two to four lines in diameter, but the size which we have found most generally useful is about two lines. To keep it from being defaced it should be laid in a small, neatly fitting gutta-percha case. In using it care must be taken that all previous stains are removed from its surface by careful wiping, it then should be pressed down to the foreign substance, and made to rotate upon it a few times. On withdrawing the probe, the porcelain will of course be soiled with blood, but this can be removed by rinsing it in water, without any danger of effacing the marks made by the lead." P. 184.

In the primary treatment of Gun-shot wounds by water dressings, now in such general use, the author makes the following very judicious remarks, in which we fully concur: "No complaints have ever been made against tepid water. No one has ever charged that it produced gangrene, or excessive suppuration even, unless it was continued a long time, and after suppuration had actually commenced; but the same cannot be said of cold water and of ice water. Many Surgeons have declared to us that they have seen much mischief done in this way, and we have ourselves seen several conclusive examples.

"It is our confident belief that, where the bleeding has wholly ceased, tepid water ought to have the preference as a first application, but that from this point of time, or soon after, the temperature may be gradually and steadily lowered for several days; keeping constantly in mind that our object ought to be, not to extinguish the inflammation, but only to control it, and for this purpose we may, commencing at some time during the first or second day, lower the temperature to 80°, 70°, or even 60° or 50° Fahrenheit, just in proportion as the inflammation increases, and then gradually elevate its temperature as the inflammation declines, or as suppuration intervenes. Usually, however, it will be best not to make a change of more than 10° or 15°.

"Returning to the matter of temperature, we wish to say that the final decision as to whether we shall in any case employ tepid, cool, cold, or ice-cold applications, must depend upon the sensations of the patient. We shall seldom or never err if we make use of that temperature only which the patient declares most agreeable. Irritation is the first link in the chain of circumstances which results in inflammation, and pain is its subjective sign; we may therefore conclude that those applications which most effectually allay pain, or obviate sensations of burning, smarting, throbbing, etc., will most certainly prevent or subdue irritation and inflammation; and that the opposite of this proposition, namely, that whatever increases pain, etc., will increase inflammation, is equally true.

"Upon this one point nearly all the Surgeons who have used water in the treatment of wounds have arrived at the same conclusion. The majority have preferred tepid water; some have preferred cold, and a few have declared their general preference for ice water. But however much they have differed in relation to absolute temperature, they have never, so far as we are aware, deviated from the opinion that if the application increases the pain it is actually hurtful. Their views will be found further illustrated and sustained in that excellent treatise entitled 'On the Employment

of Water in Surgery," written by M. Alphonse Amussat of Paris and published in 1851, and which we translated into English the same year." p. 211.

In the after treatment of Gun-shot wounds, the author again refers to the use of water in the following language:

"In regard to the water dressings, the rule which has been laid down as applicable in the first instance still holds good, namely, that the temperature be made agreeable to the patient. It will often be found, however, as the inflammation progresses, that the temperature may be gradually lowered; and in a few examples of active inflammation, invading a large amount of soft structure, even the refrigerating mixtures may be employed. It is certain that actively inflamed surfaces tolerate a greater degree of cold than surfaces only slightly inflamed, probably for the reason that caloric is elaborated under these circumstances much more rapidly. Yet it is possible to freeze inflamed tissues, and some care is required to avoid this accident. The ice, snow, or ice water should not be applied directly to the skin, but always with some non-conductor interposed, such as cloth, lint, or a beef's bladder; the latter, half filled with the cold mixture, constitutes the most convenient mode of application. If after the cold has been applied some time the patient experiences a sense of numbness in the part, a total loss of sensation, or a cold clammy sensation, even though it may not be actually painful, the water ought at once to be discontinued or its temperature raised. It is our opinion also, that in all cases the temperature should be gradually elevated as suppuration takes place. Indeed very cold applications must be limited ordinarily to a brief period of time, or to that period during which the inflammation is actually culminating.

"In confirmation of what we have said as to the hazards of cold applications, we shall take the liberty of quoting the following passages from Amussat, on the use of water in surgery:—

'Goursaud reports a case of Guyenot's, in which ice having been applied an hour or two upon a strangulated crural hernia, the hernia was not reduced, and the Surgeon, obliged to resort to an operation, found the epiploon frozen; the intestinal knuckle was, however, not injured, and the patient recovered

'I have notes of the case of a patient affected with a phlegmonous erysipelas of the arm and forearm, with whom the continued application of ice produced a solidification of the pus, so that for its removal it became necessary to resort to shampooing, and very firm graduated compression.

'My father has been often consulted on account of a gangrene which he has thought ought to be attributed to the employment of very cold water; among the cases of gangrene which I have myself seen, there are several which must be ascribed to the same cause.

'I have collected also several cases of patients who having been submitted to irrigations with cold water, have suddenly died with some nervous malady. What part does the cold play in the development of these phenomena? Without being assured that it is the principal cause, I believe I can at least say that it has some agency.

'Who will affirm,' says M. Richet, 'that the application of a powerful refrigerant upon a large surface will not, by repelling inward upon the viscera the blood which originally abounded in the diseased part, occasion congestions, and give birth to those complications to which I have alluded! The facts are everywhere to be seen, and the practitioner ought to profit by them.'

'It is well known, says Sanson, 'that cold applications may cease to be useful, and may even become hurtful, by rendering the flesh œdematous and pale, and causing it to become irritable when suppuration is established in the wounds. Sometimes also they entirely prevent the development of inflammation to such a degree as that at the end of twelve or fifteen days the wound is still in nearly the same condition as at the moment of the accident.'

'M. Apvrille reports a fact upon this point, which occurred in the service of M. Jobert. A woman had received a blow from the horn of a cow, which had torn extensively the skin and superficial muscles of the abdomen; cold water compresses were applied and renewed every ten minutes; when this mode of treatment had been pursued for some time, the wound was found to have made no progress toward a cure, and the cold was suspended. The next day a violent inflammation ensued; again the cold water compresses were applied, and the wound returned to its original condition. A renewed suppression of the compresses was followed by a yet more intense inflammation. Gradually a flabbiness supervened, and the patient died.

'M. Cloquet has remarked to me that he has observed the phenomena noticed by Sanson, in debilitated subjects, when cold has been used perseveringly.

'Cold,' says Tanchou, 'is only suitable for the young and robust; with feeble persons, the very old, and with infants, it is always injurious.' This proposition is the more true as the time of the application is the more prolonged.

'One will ask, perhaps, why the accidents of which we speak are not observed more frequently? I answer, that in general Surgeons have not taken care to note them, and farther, the temperature and the quantity of water employed in a given time being seldom indicated in the report, it is difficult to understand exactly the degree of refrigeration produced, and whether, therefore, the accident ought or ought not to be ascribed to the cold.

'We see from what precedes, that if cold water possesses some great advantages, it has also many inconveniences, and under certain circumstances it becomes even dangerous. We ought then to prefer tepid water, which calms the pain, and produces the desired effect of subtracting the caloric without exceeding the proper limits, and without exposure to any of the inconveniences of cold water, such as chills, too sudden suppression of the inflammation, and especially gangrene.'" pp. 214--217.

In speaking of Gun-shot wounds of the thorax, Prof. H. thus disposes of the question regarding the propriety of closing the orifice:

"Military Surgeons have of late been generally agreed that in most cases Gun-shot wounds of the chest ought not to be immediately closed. This is in accordance with the general statement of our own views which we have already made. Recently, however, Assistant-Surgeon Howard, of the U.S.A., has recommended an opposite practice. He proposes, having first removed as far as possible all foreign substances, to hermetically seal the external wounds at once. In order to accomplish this more certainly, he pares away with a sharp knife the contused margins down to the bone or to the pleura, giving to the wounds an elliptical form; and then approximates the edges with silver sutures, which are introduced at very short intervals, and made to penetrate deeply; over the whole surface he now spreads collodion, in which the fibres of loosened charpie are imbedded to prevent more effectually the separation of the edges. A compress and bandage may be added if necessary.

Dr. Howard claims for this method that it will assist in controlling the hemorrhage; that it will relieve the dyspnœa, and prevent or diminish suppuration.

It is perhaps scarcely proper to attempt a criticism of these views at this moment, since the results have not yet been given fully to the profession. It will be proper, however, to state that this practice, in a form more or less modified according to circumstances, has been recommended and adopted in penetrating or perforating wounds of the chest made by sharp instruments; in all penetrating or perforating wounds of the abdomen, whether Gun-shot or incised; and in all Gun-shot wounds of the chest accompanied with severe and alarming hemorrhage from the pulmonic vessels. The novelty consists in the application of this method to *all* wounds of the chest; and it is precisely this exclusive view of the practice to which Surgeons will hesitate to give their approval.

We will attempt to indicate what thoracic wounds seem to us to demand or permit immediate closure of their external orifices.

First.—All simple incised and punctured wounds; in which class of accidents ample experience has shown that we have not much to fear from suppuration, and that we may reasonably expect union by adhesion throughout the whole course of the channel caused by the weapon.

Second.—All wounds made by smooth round balls or shot, which have not come in contact with and broken any portion of the bony parietes, and into which no foreign substance has been conveyed.

Third.—When both pleural cavities have been opened by the weapon or the projectile; since the free admission of air into both sides of the chest would, in most cases, cause death immediately, and it is proper to anticipate and provide against such an occurrence by every possible means.

Fourth.—When the pulmonic hemorrhage—the blood escaping freely from the external orifices—is very profuse and alarming. In closing the wound, under these circumstances, the purpose would be to allow the blood to accumulate within, with the hope that eventually, and before fatal syncope was induced, the pressure of the coagulated mass upon the wounded lungs would close the vessels. In this case, however, the wound should not be closed by sutures, but with compresses and adhesive straps, in order that, if the pressure of the blood became so great as in itself to threaten death by suffocation, by removing the dressings it might be allowed again to escape.

Fifth.—When it is ascertained that the sense of suffocation is due to the presence of air in the pleural cavity and not to blood; if at this moment the external wound is open it will be proper to close it, temporarily at least, and to keep it closed so long as the breathing is thereby relieved.

"The cases which remain after this enumeration, and in which we cannot from our present experience advise a closure of the wound, are :—

First.—Gun-shot wounds made by conical rifle-balls, and by all projectiles of a larger size (with the exceptions as to pneumo-thorax, pulmonary hemorrhage, and perforation of both cavities already stated).

Second.—Gun-shot wounds made by any form or size of projectile, in which fragments of bone or other foreign substances have been sent into the cavity of the chest and cannot be removed.

Third.—'Penetrating' Gun-shot wounds, or those in which the missile itself remains within the chest.

In not one of these latter cases would it seem proper to hermetically seal, or even close temporarily, the external orifices. The very rare examples of recovery from such injuries, without excessive suppuration, do not warrant a reasonable expectation of a result so desirable." pp. 278-280

Gun-shot fractures of the femur have, during the late war, been very often left to nature, in consequence of the great mortality which attended amputations, and the statistics the author has been able to collect are not of such a character as to settle the practice in these cases. The following are his conclusions:

We are prepared to say, however, that the Surgeon ought not to attempt to save the thigh after a Gun-shot fracture, when any of the following conditions obtain.

When the patient has to be carried far over rough roads and without adequate support to the limb.

When the bones are greatly comminuted.

When the patient suffers great pain, or violent spasms continue in spite of opiates and rest.

When the soft parts have suffered great contusion, as in case of a fracture from a solid shot or shell.

When there is very extensive laceration of the soft parts.

When the principal arteries or nerves are involved in the injury.

When the fracture implicates the knee-joint, or even when it is near the knee-joint; experience having shown that amputations near the knee-joint give a better percentage of

recoveries than any other thigh amputations; while, on the other hand, attempts to save the limb in these cases give a worse percentage of success than in any other fracture of the thigh.

Under the following circumstances we would not, as a rule, resort to amputation:

When the ball has entered the head, neck, or trochanteric portion of the femur. Owing to the more spongy nature of the femur in these parts, and the presence of a less amount of solid lamellated structure, there is usually here less comminution than in Gun-shot injuries of the shaft. The great vascularity of the trochanteric portion, and the firmness with which the bone is attached to the adjacent tissues, diminish the danger of necrosis and exfoliation. The cases to which we have already referred seem to justify this conclusion. If any surgical operation is demanded in these cases, it is usually exsection.

When the fracture is just below the trochanters; experience having shown that very few recover after these amputations. We think we have seen during the last three years more femurs united after Gun-shot fractures in the upper third of the shaft, than we have seen successful amputations after the same injuries.

When the fracture of the femur is caused by a pistol ball, by a round musket ball; or by any missile, whose force is nearly spent.

It will be understood that the last observation has reference solely to the less degree of comminution which these missiles usually occasion." pp. 399-401.

We subjoin the author's views with regard to amputations:

"*What conditions of the Limb in Army practice demand Amputation?*

Simple fracture of a limb, it is unnecessary to say, does not demand amputation.

A fracture complicated with considerable laceration of the skin, or of the skin and muscular tissue, does not of necessity demand amputation.

A fracture, with laceration of the main arterial trunk supplying the limb, does not necessarily demand amputation. If the artery can be tied the limb may be saved, and the fracture treated successfully.

A fracture, accompanied with the laceration of one or more of the principal nervous trunks, does not always demand amputation, yet it is a graver accident than the one last supposed.

A fracture, complicated with a destruction of both the principal arterial and nervous trunks, occurring in the course of a large limb, like the thigh, the leg, the arm, or the forearm, renders amputation necessary.

Similar lesions, without a fracture, render amputation almost equally imperative.

Comminuted fractures, accompanied with extensive lesions of the soft parts, or with a rupture of either the principal artery or the principal nerves, in the case of large limbs, generally demand amputation in army practice.

Compound fractures, with either of the above complications, in large limbs, generally demand amputation.

Fractures accompanied with extensive and violent contusion, demand amputation oftener than the same fractures accompanied with open laceration.

In army practice, Gun-shot wounds which penetrate fairly the shoulder-joint, the elbow-joint, or the wrist-joint, demand in most cases either amputation or exsection.

Gun-shot wounds penetrating the hip-joint are generally fatal, yet amputation may be practiced under some very favorable circumstances. Exsection also presents a feeble ground for hope.

Amputations after Gun-shot fractures of the upper third of the shaft of the femur are seldom successful.

Primary amputations for Gun-shot fractures in the middle or lower thirds of the femur, present a much better average of successful results.

Gun-shot wounds involving the knee-joint demand amputation in almost all cases. Guthrie has seen no recovery from a Gun-shot wound of the knee-joint, unless the limb was amputated. We have seen a few recoveries, especially when the joint was penetrated by round balls, or when the joint was slightly opened.

Gun-shot wounds, in which the ball does not actually enter the joint, but in which the bone is struck above or below, and the line of fracture extends into the joint, are subject to nearly the same rules as that class of cases in which the ball enters the joint; but the rule is less imperative.

Gun-shot wounds fairly penetrating the ankle-joint or the tarsal bones, demand either amputation or exsection.

Gun-shot wounds of the metacarpal or of the metatarsal bones are often cured without amputation. Similar wounds of the fingers or toes do not in general result so favorably; but the rule in this latter case cannot be stated very positively.

Second.—*The point at which the amputation is to be made.*

This must depend mostly upon the part of the limb which has suffered injury; but in general we may say, at as low a point as will be safe; or in other words, we would state the rule to be, to *save as much of the limb as possible.* Yet in no case should the life be put at hazard for the sake of a limb, much less for a small portion of a limb.

There are two reasons why we adopt the rule above stated. First, because the longer the stump, the more useful it will be to the possessor; and second, because experience has shown that the nearer an amputation is made to the trunk and the larger the circumference of the limb, the greater is the danger to life. Thus, according to Malgaigne, only 1 death occurred from 26 amputations of one of the

smaller toes; 7 deaths from 46 amputations of the great toe; 9 from 38 partial amputations of the foot; 106 from 192 amputations of the leg; and 126 from 201 amputations of the thigh. Again, in the Crimea the mortality after amputations of the thigh, in a certain number of cases, was as follows: Lower third, 56 per cent.; middle third, 60 per cent.; upper third, 86 per cent.; hip, 100 per cent. (23 cases).

Stephen Smith, in a paper on hip-joint amputations, has brought together 98 cases, obtained partly from military and partly from civil practice, of which 56 proved fatal; a ratio of mortality of only 57½ per cent. In the Mexican campaign all amputations at the hip-joint terminated fatally. In a total of 44 cases of amputations for Gun-shot injuries, collected by Legouest, 40 died. The four which recovered were secondary amputations.

During the present war two successful amputations have been made at the hip-joint. One by Edward Shippen, Surgeon, U.S.V., and one by Dr. E. S. Fenner, of the Confederate Army." Pp. 420-423.

In conclusion we commend Prof. Hamilton's work as a valuable contribution to Military Surgery, which will do credit to the United States.

ARTICLE IV.

Circular No. 6, *War Department, Surgeon General's Office, Washington, November* 1, 1865. *Reports on the Extent and Nature of the Materials Available for the Preparation of a Medical and Surgical History of the Rebellion.* Printed for the Surgeon General's Office, by J. P. Lippincott & Co.; Philadelphia: 1865. Illustrated with one hundred and nine figures and five plates.

This circular which has been published by Brevet-Major General Joseph K. Barnes, Surgeon General, U. S. A., for the information of the Medical officers of the United States Army, is composed of two distinct reports, drawn up from materials in the Surgeon General's Office.

The first report, by George A. Otis, Brevet-Lieutenant Colonel and Surgeon U. S. Vols., in charge of the Division of Surgical Records, S. G. O. and Curator of the Army Medical Museum, relates more exclusively to the Surgical records of the recent civil war; and the second report, by J. J. Woodward, Assistant Surgeon and Brevet-Major, U. S. A., in charge of the Record and Pension Division, Surgeon General's Office, and of the Medical Section, Army Medical Museum, relates chiefly to the Medical Statistics of the several armies and general hospitals, and to the memoirs and reports by medical officers, on the causes, symptoms, and treatment, and pathological anatomy of the more important camp diseases.

We shall confine the present review to the Surgical report by Surgeon George A. Otis, and shall endeavor to give such an analysis as will embody every fact of value in the very language of the author; believing that this information will prove of great interest and value to the medical officers of the late Confederate States' Army. The report of Dr. Woodward will be reviewed in the next number of this Journal.

The materials in the Surgeon General's office relating to the surgery of the late war, consist of the reports of medical officers engaged in it, and of illustrations of these reports in the shape of pathological specimens, drawings, and models. The documentary data are of three kinds: first, the numerical returns, in which the number alone of the different forms of wounds, accidents, injuries, and surgical diseases is given; secondly, what may be called the nominal returns, in which are furnished the name and military description of each patient, and the particulars of the case, with more or less of detail; and, thirdly, the miscellaneous reports. To the first class belong the "classified return of wounds and injuries," which every medical officer has been required to furnish immediately after every engagement; the "tabular statement of gun shot wounds," and the portion of the "monthly report of sick and wounded," referring to surgical diseases and accidents. The second class comprises the "quarterly reports of wounded," required of all general and post hospitals; the "quarterly sanitary reports of regimental surgeons;" "the nominal lists of wounded,"

procured by medical directors after every general engagement; and extracts from "case books." In the second class are included the reports of medical directors of armies in regard to the operations of the medical department, and the succor given to the wounded; reports and dissertations on new methods and modes of treatment, and modifications of surgical apparatus and appliances; pathological researches on morbid processes, pertaining to surgery, as hospital gangrene, osteomyelitis, pyæmia, and the like; plans for ambulance organization, and the transportation of the wounded by land and water.

Surgeon Otis affirms that the extent of these materials is simply enormous, and that the returns are of as huge proportions as the armies that have been engaged in active operations for the last four years. The author of this portion of the work, still farther expresses his belief that the result of the labors of the medical officers of the United States' Army has been the accumulation of a mass of facts and observations in military surgery of unprecedented magnitude.

Whilst it has been found as yet impracticable to determine with accuracy the number of wounds received in action during the late war, some conception may be formed of the vast numbers dealt with, by a comparison of a portion of the returns with the complete statistics of other armies.

Thus, in the British army in the Crimea, during the entire war, there were 12,094 wounded, and 2,755 killed, or a total of 14,849; in the French army, in the Crimea, of a total effective force of 309,268, according to M. Chenu, there were 39,868 wounded, and 8,250 killed, or a total of 48,118; whilst in the late war, the monthly reports from a little more than half the United States' regiments in the field, give for the year ending June 30, 1862, an aggregate of 17,496 gunshot wounds; the reports from rather more than three-fourths of the regiments, for the year ending June 30, 1863, give a total of 55,974 gunshot wounds; and the battle-field lists of the wounded of the United States' armies for the years 1864–65, include over 114,000 names. Great as these figures appear to be, they are still below the mark, for many wounded

were received directly into the general hospitals whose names were never entered upon the field reports.

Whilst, therefore, the total killed and wounded in the English and French armies during the Crimean War, numbered 62,967; the incomplete returns of the United States' armies show three times this number of gunshot wounds, or more exactly 187,470.

And in pondering over these figures, the reviewer cannot refrain from expressing his wonder, that the imperfectly armed, half-clad, half-fed, and unpaid battalions of a sparsely settled country, with imperfect supplies of arms and ammunition, without manufactories, cut off from the rest of the world, with less than eight millions of white inhabitants, with innumerable internal enemies and spies, and with a dangerous class of laborers which formed an invaluable recruiting ground to their enemies in addition to all Europe: should have bravely withstood, during four long years of unexampled privation and suffering, three millions of men in arms; and have inflicted four-fold as much damage, as the well appointed and immense armies of one of the greatest powers of Europe inflicted upon the combined armies of England and France.

The gigantic nature of the late civil war between the different sections of the United States, has been still farther shown by Surgeon Otis, in comparing the relative numbers of cases of some important injury; as, for example, gunshot fractures of the femur, it is found that in the French Crimean army, there were 459 such injuries, and in the English army 194, while over 5,000 such cases were reported to the Surgeon General's office of the United States' army: or if one of the major operations is selected for comparison, as excision of the head of the humerus, the Crimean returns give sixteen of these excisions in the British, and thirty-eight in the French army, whilst the registers of the United States' army contain the detailed histories of 575 such operations.

The surgical specimens of the Army Medical Museum are said to number 5,480, and Surgeon Otis affirms that not only in specimens of recent injuries, but in illustrations of reparative processes after injury, of morbid processes, of the results of operations, and

of surgical apparatus and appliances, this institution is richer, numerically at least, than the Medico-Military Museums of France or Great Britain.

After several efforts to arrange the original records in a form more convenient for reference and study, the following classification of wounds and their results, and of operations was finally adopted. It is less elaborate than that employed in the British statistics of the surgery in the Crimea, and more detailed than that followed by M. Chenu, in the French Surgical Report of the Crimean War. The appended figures give the number of cases of each class that were revised and corrected upon the new registers in September 30, 1865.

Classification of Wounds and Injuries, and Their Results, followed in the Division of Surgical Records. Surgeon General's Office, United States Army.

Gunshot fractures and injuries of the cranium	1,108
Gunshot fractures of the bones of the face	1,579
Gunshot fractures of the spine, not involving the chest or abdomen	187
Gunshot fractures of the ribs without injury of the thoracic or abdominal viscera	180
Gunshot fractures of the pelvis, not involving the peritoneal cavity	397
Gunshot fractures of the scapula and clavicle, not implicating the thoracic cavity	389
Gunshot fractures of the humerus	2,408
Gunshot fractures of the radias and ulna	785
Gunshot fractures of the carpus and metacarpus	790
Gunshot fractures of the femur	1,957
Gunshot fractures of the patella and knee joint	1,220
Gunshot fractures of the tibia and fibula	1,056
Gunshot fractures of the tarsus and metatarsus	629
Gunshot penetrating wounds of the chest and injuries implicating thoracic viscera	2,303
Gunshot penetrating wounds of the abdomen and injuries involving the abdominal viscera	565
Gunshot scalp wounds	3,942
Gunshot flesh wounds of the face	2,588
Gunshot wounds of the neck	1,329
Gunshot wounds of the thoracic parietes	4,759
Gunshot wounds of the back	5,195
Gunshot wounds of the abdominal parietes	2,181
Gunshot wounds of the genito-urinary organs	468
Gunshot wounds of the upper extremities	21,248
Gunshot wounds of the lower extremities	25,152
Gunshot wounds of arteries	44
Gunshot wounds of veins	3
Gunshot wounds of nerves	76
Sabre wounds	106
Bayonet wounds	143
Simple fractures and miscellaneous wounds and injuries	2,883
Cases of tetanus	363
Cases of secondary hemorrhage	1,035
Cases of pyæmia	754
Total	87,822

Classification of Surgical Operations followed in the Division of Surgiacl Records. Surgeon General's Office, United States Army.

Amputations of the fingers		1,849
Amputations at the wrist joint		46
Amputations at the fore arm		992
Amputations at the elbow joint		19
Amputations of the arm		2,706
Amputations at the shoulder joint		437
Amputations of the toes		802
Amputations of the foot (partial)		160
Amputations at the ankle joint		73
Amputations of the leg		3,014
Amputations of the knee joint		132
Amputations of the thigh		2,984
Amputations at the hip joint		21
Excisions of the head of the humerus		575
Excisions of the elbow		315
Excisions of the wrist		34
Excisions of the ankle		22
Excisions in the continuity of the upper extremities	Shaft of humerus; Radius; Ulna; Radius and ulna	695
Excisions of the shafts of the tibia and fibula	Tibia; Fibula; Tibia and Fibula	220
Excisions of the knee		11
Excisions of the shaft of the femur		68
Excisions of the head of the femur		32
Excisions of the bones of the face and neck		101
Trephining		221
Ligations of arteries		404
Extraction of foreign bodies		726
Operations for surgical diseases		443
Operations not included in other categories		23
Total		17,125

ON SPECIAL WOUNDS AND INJURIES.

Gunshot Injuries of the Head.—They number 5,056, and have been recorded in two classes: First, The gunshot fractures and injuries of the cranium, including the perforating and penetrating and depressed fractures, the fractures without known depressions, and the contusions of the skull resulting in lesions of the encephalon; and, Secondly, the simple contusions and flesh wounds of the scalp.

In the first class, 1,104 cases are recorded; of 704 of them, of which the results have been ascertained, 505 died, and 199 recovered. In 107 of these terminated cases, the operation of trephining was performed, of which sixty died and forty-seven recovered. In 114 cases, fragments of bone or foreign substances were removed by the elevator or forceps, without the use of the trephine; and of these sixty one died, and fifty three recovered. When operative proceedures were instituted, the recoveries were

45, 3 per cent. But it must be apprehended that this favorable exhibit will be materially modified when a larger number of results are ascertained, and that a greater proportion of the field operations of trephining, in which the results are stated to be undetermined, were lost sight of and terminated fatally. In the 483 cases treated by expectancy, the ratio of recovery is only 20, 5 per cent. But the latter group of cases includes nearly all of the penetrating and perforating fractures, and it would be unwise to base on these figures an argument of operative interference.

The gunshot contusions and wounds of the scalp that have been entered on the records, number 3,942, of which 103 terminated fatally. It is altogether probable that in all of these fatal cases, some undiscovered injury was done to the cranium or its contents; or that the peri-cranium was removed, and death of bone ensued, with consecutive lesions of the encephalon. The histories of many of these cases are now under investigation, and so far as ascertained, the fatal results have depended upon concussion or compression of the brain, or upon the formation of abscesses in the liver or lungs, in consequence of inflammation in the veins of the diploe. Compression has resulted either from extravasation of blood, or inflammation of the brain or its membranes, or from suppuration. This portion of the report is illustrated with a number of cases and drawings of fractures of the cranium. The following remarks upon these cases appear to be worthy of consideration:

"The foregoing case illustrates the fallacy of Potts' views in relation to trephaning for pus under the skull-cap; and yet, under such circumstances, the best modern authorities advise the use of the trephine as affording the patient the only chance of recovery. The records attest how slight this chance is, and corroborate the observation of Mr. Hewett,* that 'the successful issue of a case of trephining for matter between the bone and the dura mater is almost unknown to surgeons of our own time.'"

"According to Mr. Teevan's† experimental inquiries, the aperture of exit in gunshot perforations of the cranium is always

*A System of Surgery, Theoretical and Practical, in treatises by various authors. Edited by T. Holmes, M. A., Cantab. London: 1861; vol. i, p 101.

†British and Foreign Medico-Chirurgical Review, vol. xxxiv, p 205.

larger than the aperture of entry, because it is made by the ball *plus* the fragments of bone driven out from the proximal table and the diploe."

We would also add, in virtue of the change in the symmetrical form of the ball and the diminished velocity:

"While the number of fatal results after trephining are very great, the examples of success are yet numerous. The data are not sufficiently complete to admit of fair comparative analysis; still it is difficult to avoid the impression that a larger measure of success has attended this operation in the late war, than the previous experience of military surgeons would have led us to anticipate. Surgeon D. W. Bliss, U. S. Vols., alone has reported eleven successes after the use of the elevator or trephine. Even in those almost hopeless cases in which compression of the brain follows a gunshot injury of the skull at a late date, instances of recovery are reported."

"The occurrence of hernia or fungus cerebri is mentioned in connection with eighteen cases of gunshot fracture of the skull, complicated by lacerations of the dura mater and brain. In four of these cases recovery took place without operative interference with the protruding fungous mass, which, in these instances, gradually contracted, was then covered by granulations, and finally cicatrized. In those cases in which bandaging and compression was resorted to, cerebral oppression was soon manifested, and stupor and coma eventually supervened. In those in which the tumor was sliced off, as usually recommended, at the proper level of the brain, it was commonly speedily reproduced, and death from irritation ensued." p. 17.

"In looking over the registers of gunshot injuries of the head, two general facts are noticed: First, that in the after treatment of scalp wounds, a multitude of surgeons did not consider spare diet, perfect rest, and antiphlogistic measures as of essential importance; and, Secondly, that in the treatment of cranial fractures, the general tendency was to the practice recommended by Guthrie, in regard to operative procedures, rather than the more expectant plan insisted upon by the majority of modern European writers on military surgery." p. 17.

"*Gunshot Wounds of the Face.*—Of 4,167 gunshot wounds of the face transcribed from the reports from the beginning of the war to October, 1864, there were 1,579 fractures of the facial bones, and 2,588 flesh wounds. Of the former, 891 recovered, 107 died, and the terminations are still to be ascertained in 581 cases

Secondary hæmorrhage has been the principal source of fatality in these injuries. It is a frequent complication in gunshot fractures of the facial bones; and the difficulties in securing bleeding vessels in this region are very great. Recourse has often been had to ligations of the carotid artery, with the result of postponing for a time the fatal event.

Owing to the great vascularity and vitality of the tissues in this region, gunshot wounds of the face have commonly healed rapidly, and many creditable plastic operations for the relief of deformities following such injuries have been accomplished." p. 20.

Gunshot Wounds of the Neck.—Of the 1,329 cases of this category that have been entered on the records, the ultimate results have been ascertained in 546 cases only, and in these the mortality is fourteen per cent. Several instances are recorded in which large grape shot, on striking the hyoid bone, were deflected, and buried themselves in the supra-spinous fossa of the scapula, or among the muscles of the back. These patients died from laryngnitis or œdema of the glottis, and might have been saved perhaps by tracheotomy; but they died suddenly, when surgical assistance could not be immediately procured. p. 20.

Gunshot Wounds of the Back and Spine.—In this class have been included the fractures of the vertebral column which were not complicated by penetrating wounds of the chest or abdominal cavity, and flesh wounds of the region covered by the trapezius, latissimus dorsi, and gluteal muscles. Of 187 recorded cases of gunshot fractures of vertebræ, all but seven proved fatal. Six of these were fractures of the transverse or spinous apophyses. The seventh case is that of a soldier wounded at Chicamauga, September 20, 1863, by a musket ball, which fractured the spinous process of the fourth lumbar vertebra, and penetrated to the vertebral canal. The ball and fragments of bone were extracted

at a Nashville hospital. The last report states that the patient is likely to recover.

Five thousand one hundred and ninety-four gunshot wounds of the back have been recorded, of which a large proportion are injuries from shell. Troops being often ordered to lie down under a shell fire, this region becomes particularly exposed. p 21.

Gunshot Wounds of the Chest.—Of 7,052 gunshot wounds of the chest that have been examined and transcribed from the reports, belonging to the period prior to July, 1864, there were 2,303 that either penetrated the thoracic cavity or were accompanied by lesions of the thoracic viscera. The results have been ascertained in 1,272 of these, and were fatal in 930, or seventy-three per cent. The 4,759 flesh wounds presented a very small ratio of mortality. It was observed, however, that they were commonly long in healing, in consequence, no doubt, of the mobility of the thoracic parietes.

In the treatment of penetrating wounds of the chest, venesection appears to have been abandoned altogether. Hæmorrhage was treated by the application of cold, perfect rest, and the administration of opium. These measures seem to have proved adequate generally, and no instances are reported of the performance of paracentesis or of the enlargement of wounds for the evacuation of effused blood. Hæmorrhage from the vessels of the costal parietes has been exceedingly rare, and in the few instances recorded, was a secondary accident. Hence, the management of bleeding from wounded inter-costal arteries has presented theoretical rather than practical difficulties. It has been the common practice to remove splintered portions of fractured ribs, and to round off sharp edges that were likely to wound the pleura or lung. After this, with the exception of extracting foreign bodies, whenever practicable, and performing paracentesis when empyema was developed, it has been usual to leave these cases to the natural process of cure.

The records of the results of the so-called method of 'hermetically sealing' gunshot penetrating wounds of the chest are sufficiently ample to warrant an unqualified condemnation of the practice. The histories of the cases in which this plan was

adopted have been traced, in most instances, to their rapid fatal conclusion.

Few examples of recovery are recorded where the track of the ball passed near the root of the lung. The cases in which there was a fracture of the ribs at the wound of entry were very dangerous. The established opinion, that penetrating wounds with lodgment of the ball are more fatal than penetrating wounds, was amply illustrated. But very few recoveries with balls lodged in the lung are recorded, and the histories of such cases are less explicit and complete than could be desired.

Only four cases are recorded of gunshot wounds of the heart that came under treatment. The patient that lived longest after a gunshot wound of the heart, survived twelve hours. In this case a small pistol-shot entered the left ventricle and passed out through the right auricle. pp. 21–23.

Gunshot Wounds of the Abdomen.—Of 2,707 gunshot wounds of the abdomen reported from the beginning of the war to July 1st, 1864, there were 2,164 flesh wounds, and 543 cases in which the peritoneal cavity was penetrated or the abdominal viscera injured. Among the flesh wounds, 114 fatal cases are recorded, which were, in most instances, cases of sloughing from injuries of the abdominal parietes by shells. Of the 543 penetrating wounds, the results have been ascertained in 414, and were fatal in 308, or 74 per cent.

In many cases fæcal fistulæ were produced; they commonly closed after a time, without operative interference, reopening at intervals, and then healing permanently.

Recoveries after wounds of the large intestines have been much more numerous than after wounds of the ileum or jejunum.

No case has been reported in which it was thought expedient to apply a suture to the intestines after gunshot wounds.

Gunshot wounds of the liver were usually followed by extravasation into the abdominal cavity and rapidly fatal peritonitis. Of 32 cases in which the diagnosis was unquestionable, all but four terminated fatally. All cases of gunshot wounds of the spleen that have been reported, were fatal.

Gunshot wounds of the bladder, when the projectile entered

above the pubes, or through the pelvic bones, have proved fatal, so far as the records have been examined. There are many examples of recovery, however, from injuries of the parts of the bladder uncovered by the peritonæum.

Several examples of recovery, after protrusions of the abdominal viscera through gunshot wounds have been reported. In two cases in which loops of small intestine issued, they were immediately returned and retained by means of adhesive strips and bandages, and the patients recovered with ventral hernia. The escape of omentum, through wounds, would not appear to be a very serious complication, for in many cases portions of protruding omentum have been excised, and the patients have, nevertheless, recovered promptly. pp. 24-27.

Gunshot Fractures of the Pelvis.—The records under this head include only the cases in which the abdominal cavity was not penetrated. From the beginning of the war to October 1st, 1864, 359 such cases have been reported. Recovery took place in 97, death in 77, and the result is still to be ascertained in 185. In 256 cases the ileum alone was injured, the ischium alone in 19, the pubes in 12, the sacrum in 32, and in 40 cases the lesions extended to two or more portions of the innominata. The gravity of these cases depended upon the location and extent of the fracture. The majority of recoveries were from fracture of the ileum by musket balls, in which the crest was grooved, or comparatively slight injury was inflicted. Yet there were many examples of perforation of the body of the ileum with ultimate recovery.

In most cases of injury of the pelvic bones, very tedious suppuration ensued, and Surgery could do but little, except to facilitate the escape of pus, and to remove dead bone as it became separated. The returns corroborate the observation of Stromeyer, that there is a great liability to pyæmia in gunshot fractures of the pelvis.

Gunshot Wounds of the Genito-Urinary Organs.—In this category are included gunshot wounds of the genitals or urinary organs, that are not complicated with fractures of the pelvis, or

with penetrature of the abdominal cavity. To October 1st, 1864, the reports furnish 457 such wounds, of which 37 had a fatal result. p. 29.

Gunshot Wounds of the Upper Extremities.—When unaccompanied by lesions of the vessels and nerves, the gunshot flesh wounds of the upper extremity are not very serious injuries. All foreign bodies having been extracted, they commonly heal, under the use of water dressings, and the lightest bandaging, in a few weeks. The 21,248 cases entered on the registers are all copied from the reports for the last quarter of 1863, and the first two quarters of 1864.

The gunshot fractures of the upper extremity are recorded in four classes: those of the scapula and clavicle, which are not, at the same time, penetrating wounds of the chest; those of the shaft of the humerus and either of its articular extremities; those of the ulna and radius; and those of the carpus and metacarpus. It is only with the second class that much progress has been made. This comprises 2,408 cases of gunshot fractures of the humerus that have been examined and recorded. Recovery followed in 1,253 cases, death in 436, and the result is as yet undetermined in 719 cases. In the 1,689 completed cases, amputation or excision were practiced in 996, and conservative treatment was adopted in 693, with a ratio of mortality of 21 per cent. in the former and 30 per cent. in the latter. But it is premature to make deductions from statistics which are daily augmenting and tending toward completion. p. 29.

Gunshot Wounds of the Lower Extremities.—Of these 30,014 cases have been recorded, of which 4,862 were fractures, and 25,152 were flesh wounds. The latter were transcribed from the reports from October 1st, 1863, to October 1st, 1864. Of the 1,823 cases of gunshot fracture of the femur that have been entered on the permanent records, the results have been ascertained in 1,233. Of the 1,183 cases of gunshot wounds of the knee-joint, the results are known in 740.

The following table exhibits at a glance the results of 2,003 cases of gunshot fracture of the femur, or of gunshot wounds of the knee-joint, out of a total of 3,106 cases hitherto recorded:

TABLE, Exhibiting the Results of 2,003 *Terminated Cases of Gunshot Fracture of the Femur, or of Gunshot Wounds of the Knee-Joint, out of* 3,106 *cases that have been entered on the records.*

NATURE OF WOUND.	TOTAL TERMINATED	AMPUTATION				EXCISION				CONSERVATIVE MEASURES				AGGREGATE
		Recovered	Died	Undetermined	Mortality Rate of Determined Cases	Recovered	Died	Undetermined	Mortality Rate of Undetermined Cases	Recovered	Died	Undetermined	Mortality Rate of Determined Cases	
Gunshot Fractures of Femur implicating Hip Joint......	82	0	2	0	100	2	10	1	83.33	0	68	14	100.	97
Gunshot Fractures of Upper Third of Femur	387	8	24	11	75	7	18	6	72.	93	237	199	71.81	603
Gunshot Fractures of Middle Third of Femur	346	42	51	47	54.83	2	13	10	86.66	106	132	148	55.46	551
Gunshot Fractures of Lower Third of Femur...........	418	131	112	117	46.09	1	1	0	50.	72	101	137	57.79	672
Gunshot Wounds of Knee Joint with or without Fracture	770	121	331	266	73.23	1	9	1	90.	50	258	146	83.76	1183
TOTAL............	2003	302	520	441	63.26	13	51	18	79.68	321	796	644	71.26	3106

NOTE.—In this table the rate of mortality is calculated for the finished cases alone.

In examining the above table in detail, it is seen that the results are ascertained in 822 of the 1,263 cases treated by amputation, or 65 per cent.; in 64 of the 82 cases treated by excision, or 78 per cent.; and in 1,117 of the 1,761 cases treated by conservative measures, or 63 per cent.

The only recorded recoveries after gunshot fracture of the femur involving the hip-joint are those in which excision was practiced. In fractures of the upper third, the mortality rate is greatest for the cases treated by amputation. There were 43 of these cases, and in 19 of them the amputation was done at the hip-joint. Excision gives 7 recoveries after fractures of the upper third; 2 of these were excisions of the head and a portion of the shaft of the femur, 4 were formal excisions of the continuity, and 1 was a removal of fragments and rounding off of sharp edges of bone, which was admitted amongst the excisions with some hesitation. Under conservative measures 93 cases of fracture of the upper third had survived the injury a year or more, and are reported as recovered.

Comparing in gross the 822 finished cases treated by amputation, with the 1,117 treated by conservation, the mortality rate of the former has the advantage by 3 per cent.; an advantege that is maintained in the different regions, except in the upper third. It must be remembered that the amputations include most of the bad cases, and those in which preservation of the limb was attempted and abandoned. p. 30-32.

Gunshot Wounds of the Arteries.—The number of cases reported under this head is extremely small. In the campaign of the Army of the Potomac from the Rapidan to the James, in May, June, and July, 1864, of a total of 36,508 gunshot wounds, only 27 belong to this category. The cases of compound fracture complicated with injuries of the large vessels, the cases in which limbs are carried away by solid shot or shell, and the cases in which all the tissues of a limb are disorganized by contusion from a large projectile, and the vitality of the arteries is destroyed, are all returned under other heads. Those only are included in which the canal of a large vessel is primarily opened, and in which this is the principal accident. Such cases are to be sought for among the dead on the battle-field rather than in the Field Hospitals. Surgeon J. A. Lidell, U. S. Vols , reports that on the morning of March 25th, 1865, he examined 43 bodies of soldiers killed in the combat near Fort Steadman, in the lines before Petersburg; 23 were shot in the head, 15 in the chest, and 5 in the abdomen. The bodies of all those wounded in the abdomen were very much blanched, as if they had died of hemorrhage, and the same remark held true in regard to all but two or three of those wounded in the chest. In the few cases of primary gunshot lesions of the arteries that came under treatment, it was usually found that only a portion of the calibre of the vessel had been carried away, and that retraction had been thus prevented. But 44 cases are entered on the records. In most of them, ligatures were placed above and below the seat of injury; but in a few instances, the main trunk was tied at a distance, and amputation was practiced when the bleeding recurred; 20 of the 44 cases terminated fatally. p. 38-39.

Sabre and Bayonet Wounds.—The number of sabre and bayonet

wounds that have come under treatment has been comparatively small; 105 cases of the former, and 143 of the latter comprise nearly all that have been reported for the first three years of the war. Of these wounds, two-thirds were received in action, and the remainder were inflicted by sentinels or patrols. There are 11 deaths from sword wounds recorded, and 6 from bayonet wounds. From General Sheridan's campaign in the Shenandoah Valley, 25 sabre wounds are reported; and from the battle of Jonesborough, in Georgia, 30 bayonet wounds. p. 39.

Tetanus.—The 363 cases of traumatic tetanus recorded in the register for that subject, are all that have been reported during the war. The proportion to the total number of wounds is not large. Of the total number of cases of traumatic tetanus, 336 terminated fatally; of the twenty-seven recoveries reported, the disease was of a chronic form in twenty-three; in the remaining four cases the symptoms were very grave. In two, recovery took place under the use of opiates and stimulants; in two, after amputation of the wounded part.

The great majority of the cases were treated by the free use of opium, conjoined with stimulants and concentrated nourishment. Chloroform inhalations were very generally employed during the paroxysms of spasmodic contraction. Subcutaneous injections of the salts of morphia and atropia were frequently used. Cathartics, quinine, camphor, cannabis indica, bromide of potassium, strychnine, belladonna, and aconite are mentioned among the remedies employed. Cups, blisters, turpentine stupes, and ice were among the applications made to the spine; and fomentations with opium or tobacco were, in some cases, applied to the wound. Amputation, the division of nerves, and the extirpation of neuromata in stumps, were the surgical measures sometimes employed. The results have not modified the conclusion of Romberg, that 'whenever tetanus puts on the acute form, no curative proceding will avail, while in the milder and more tardy form, the most various remedies have been followed by cure.' The value of nicotine, of the calabar

bean, and of curare,* as curative agents in tetanus was not tested.

Autopsies were made in many cases; but with almost negative results. There were no microscopic examinations to corroborate or disprove the assertions of Rokitansky and Demme,† that tetanus has a constant anatomical lesion, consisting in a proliferation of the connective tissue of the whole medullary substance of the medulla oblongata, of the inferior peduncles of the cerebellum, of the crura cerebri, and of the spinal cord, producing a viscous mass, abounding in nuclei, and never progressing to the formation of fibres. It is frequently mentioned, however, that great congestion of the brain and spinal cord was observed, a condition on which the lesions of the connective tissue above described are believed to depend.

The records abound with illustrations of the influence of sudden vicissitudes of temperature in producing this fatal affection, and of the effect which unextracted balls and other foreign bodies and matter confined under fasciæ appear to exercise upon its development. pp. 41–42.

Secondary Hemorrhage.—On this important subject the records are still very incomplete.

Of 387 cases of secondary bleeding from stumps, 233, or sixty per cent. ended fatally; of 650 cases of secondary hemorrhage from gunshot wounds, 330 cases, or fifty-one per cent. terminated fatally. In the 1,037 recorded cases, the femoral artery was ligated ninety-three times for bleeding from stumps, and forty-five times for bleeding from wounds; the subclavian was tied five times for bleeding after amputation at the shoulder joint, and six times for hemorrhage from gunshot wounds of the axilla. The common carotid was ligated fifteen times for hemorrhage from the deep branches of the internal maxillary. Amputation was practised seventy-eight times for secondary

*According to H. Demme, of twenty-two cases of traumatic tetanus, treated by the latter agent, eight recovered. See Schweiz: Zeitschuft fur Heilkunde; ii, 356.

†Schmidt's Jahrbucher, vol. cxii.

bleeding from gunshot wounds, and re-amputation was performed fourteen times when other means of arresting hemorrhage from stumps had failed.

The 387 cases of secondary hemorrhage from stumps, were chiefly examples of arterial bleeding. In ninety-five cases, the hemorrhage was, perhaps, mainly venous, and was checked by elevating the stump, or applying cold water, ice, pressure, or the solution of the persulphate of iron. When the hemorrhage was arterial, the most common practice was to tie the main vessel, at the second bleeding, as near as was prudent to the end of the stump. The results of tying the vessel above, according to Anel's method, were very unfortunate.

In reviewing the 650 recorded cases of secondary hemorrhage from gunshot wounds, it appears that, during the earlier part of the war, there were many surgeons who were not sufficiently impressed by the precepts of Bell and Guthrie, and who frequently treated secondary hemorrhage from gunshot wounds by tying the main trunk at a distance from the wound, even when the bleeding occurred at a comparatively early period. Later in the war, however, it was the universal practice to endeavor to secure both ends of the bleeding vessel at the seat of injury, and some brilliant examples are recorded in which this was accomplished in wounds of the posterior tibial or popliteal, when limbs had become infiltrated and swollen, and the difficulties of the operations were immense. pp. 42–43.

Pyœmia.—On this subject 281 reports have been examined, and the individual cases detailed in them have been transcribed upon the registers; 251 special reports on the subject remain to be examined. The histories of 754 cases are recorded in the register, the post-mortem observations accompanying a large proportion of the fatal cases. These number 719, or 95.35 per cent. Pyæmia supervened in 377 cases of gunshot injury in which no operation had been performed, and after 295 cases of amputation, of which 155 were cases of amputation in the continuity of the femur.

The purulent infection was subsequent to excision of the shafts of long bones in twenty-seven cases and to excisions of joints in twenty-eight cases.

These figures by no means represent the frequency with which pyæmia poisoning has occurred. It has been one of the great sources of mortality after amputation, and its victims are to be counted by thousands. The small number of cases on the register are taken from special reports. The reports on the treatment of pyæmia are adverse to the therapeutical utility of the sulphites and hyposulphites in this disease. pp. 43–44.

Erysipelas.—In the ill-ventilated barracks and private edifices which were sometimes of necessity occupied as hospitals during the earlier period of the war, erysipelas was a frequent visitor. p. 87.

Gangrene.—The various forms of sloughing phagedena, and traumatic gangrene, described by systematic authors, were among the complications of wounds that throughout the war often rendered the skill of surgeons abortive, but the ravages of true contagious gangrene were comparatively limited. p. 87.

SURGICAL OPERATIONS.

Amputations.—The histories of 13,397 amputations for gunshot injury have been examined and recorded, and the final results have been ascertained in 9,705 cases. The following table exhibits the number belonging to each region, and includes both primary and secondary cases. It shows the regular increase in the rate of mortality as the trunk is approached.

AMPUTATIONS OF THE SUPERIOR EXTREMITIES.	Re-covered.	Died.	Total.	Per cent. of Mortality.
Fingers and parts of the hand	1778	29	1807	1.60
Wrist	34	2	36	5.55
Elbow	19	..	19	..
Forearm	500	99	599	16.52
Arm	1535	414	1949	21.24
Shoulder joint	144	93	237	39.24
Total	4010	637	4647	13.70

Amputations of the Inferior Extremities.	Recovered.	Died.	Total.	Per cent. of Mortality.
Toes	784	6	790	.75
Partial amputation of the foot	108	11	119	9.24
Ankle joint	58	9	67	13.43
Leg	1737	611	2348	26.02
Knee joint	52	64	116	55.17
Thigh	568	1029	1597	64.43
Hip joint	3	18	21	85.71
Total of Lower Extremity	3310	1748	5058	34.55
Aggregate	7320	2385	9705	24.57

We pass over the observations of Surgeon Otis upon the minor amputations, and will content ourselves with presenting his remarks upon the graver operations.

Amputations at the Elbow.—The returns corroborate the conclusions of Dupuytren, Malgaine, and Legouest, who combat the disfavor into which this operation has fallen. It was done infrequently in the late war, but nineteen cases having been reported. But in all of these the ultimate results have been ascertained, and were favorable in every instance. The success of Salleron, and other French surgeons, with this operation in the Crimea is well known. Whenever, then, it is practicable to amputate the forearm, disarticulation at the elbow should be preferred to amputation of the arm. The oval method answers the purpose best in this locality. p. 46.

Amputations at the Shoulder Joint.—It is creditable to the surgery of the war that the number of cases of amputation at the shoulder joint reported is less than the number of cases of excisions of the head of the humerus, and that the latter operation appears to have been adopted in nearly all the cases in which it was admissible. The reported cases of amputation at the shoulder joint, for the entire period number 458; of excisions of the head of the humerus, there were 575. Of the 237 terminated cases of amputation, ninety-three died, a ratio of mortality of 30.2, which is 6.7 per cent. greater than the mortality in excisions. p. 46.

Amputations at the Ankle Joint.—The record is incomplete. In the terminated cases, Symes' method was employed in twenty-five cases, Roux's method in two cases. The operation

of Pirogoff appears to be regarded with little favor, and it appears that the author himself has abandoned it, finding the segment of the os calcis likely to become necrosed. p. 46.

Amputations at the Knee Joint.—This operation has found numerous advocates during the war, and has been frequently performed. The returns to October, 1864, give 132 cases, of which fifty-two recovered and sixty-four died. In six cases, amputation of the thigh was subsequently performed. with three recoveries and three deaths. In ten cases the result is undetermined. These figures are encouraging, and if we look at the primary operations alone, the result is still more gratifying. Of forty-nine cases of primary amputation at the knee joint, thirty-one recovered, and sixteen died; while two underwent re-amputation, of whom one recovered, and one, a tuberculous subject, died. This gives a percentage of mortality in primary amputations at the knee joint of 34.9. The mortality in primary amputation at the lower third of the thigh is much larger than this; indeed, it has been already indisputably proved by the Crimean statistics, and by M. Malgaine, that the mortality in amputation augments in exact proportion as the incisions approach the trunk. p. 47.

Amputations of the Thigh.—In 1,597 terminated cases, 568 recovered, and 1,029 died, or 64.43 per cent., which is within a fraction of the mortality, after amputation of the thigh: in the English army in the Crimea, the whole number of amputations of the thigh for gunshot injuries was 1,666, of which 1,531, or 91.89 per cent. terminated fatally. Of these 1,597 amputations, the date of operation is ascertained with precision in 1,061. Of these, 423 were primary and 636 were intermediate or secondary. The ratio of mortality was 54.13 in the former, and 74.76 in the latter. p. 48.

Amputations at the Hip Joint.—At the commencement of the war, the uniform fatality of amputations at the hip joint in the Crimean war was impressed upon the minds of surgeons, and many believed that the operation should be discarded altogether. Still it has been occasionally performed, and several lives have unquestionably been saved by it.

Surgeon Otis sustains the truth of this assertion by the record of three successful amputations at the hip joint, illustrated by a handsome plate and wood cut. pp. 48–51.

TABLE, showing the Mortality of Amputations at the Hip Joint, for Gunshot Injury, Including Primary, Intermediate, and Secondary Cases.

	Recov'd.	Died.	Total.
Larrey's primary cases	..	6	6
Larrey's intermediate cases	1	..	1
Guthrie's Ciudad Rodrigo cases (intermediate)	..	1	1
Guthrie's Waterloo cases (primary)	1	..	1
S. Cooper's case	..	1	1
Blandin's cases (in 1794)	..	3	3
Huten (Mem. de Med. Mil., t, xliv)	..	2	2
Brownrigg (Elvas, 1811)	..	1	1
Wedemeyer (Bull. de Ferusæ, t, iii, p. 161)	..	2	2
Letulle (Siege d' Anvers)	..	1	1
Clot Bey (Legouest's table)	..	1	1
Jubiot (idem)	..	3	3
Guyon (Algeria, 1840)	..	1	1
Sedillot (Annales de la Chir., t, ii, p. 279)	..	5	5
Richel (Journees de Juin, 1848)	..	1	1
Robert (idem)	..	1	1
Guersant (idem)	..	1	1
Vidal (idem)	..	1	1
Baudens (Traite des Plaies d' Armes a Feu)	1	..	1
Schleswick Holstein cases	..	6	6
Langenbeck's case (Schleswick Holstein)	1	..	1
Two operations in the English army, in the Crimea, by the Director General	..	2	2
A soldier of the 33d English regiment	..	1	1
Two other cases prior to April, 1855, in the English army in the Crimea	..	2	2
Seven enlisted men and two officers (Med. and Surg. Hist. of British army in the Crimea)	..	9	9
Twelve primary cases in the French army in the Crimea	..	12	12
Mounier's case at Dolma Batchi	..	3	3
Legouest's case (really recovered and died of cholera)	..	1	1
Four other secondary cases in the French Crimean hospital	..	4	4
Bertherand's case after the engagement at Novara (Campagne d' Italie de 1859. p. 37)	..	1	1
Jules Roux cases at Toulon (all secondary)	4	2	6
Primary cases in the late war (U. S.)	2	7	9
Secondary cases in the late war (U. S.)	1	11	12
	11	92	103

From an examination of the results of the preceeding table, and from a careful analysis of all the cases of hip joint amputations during the late war, Surgeon Otis concludes that there are but three conditions under which early amputation at the hip joint is admissable in military surgery, viz: when nearly the entire thigh is carried away by a large projectile, when the totality of the femur is destroyed by osteomyelites, and, possibly, when, with comminution of the upper extremity of the femur, the femeral vessels are wounded.

The experience of M. Jules Roux, in the Italian war, seems to prove conclusively that secondary amputations at the hip joint are less dangerous than primary ones.

As to the method of operating, it may be observed that the anterior single flap procedure has of late been generally performed. pp. 48–53.

Excisions.—The number of excisions after gunshot injuries that have been transcribed from the reports, has been given on page 104 of this review, and indicates that this branch of conservative surgery was largely practiced by the medical officers of the United States army during the late war.

We shall extract from the report the statistics and observations upon the more important excisions.

Excisions of the Wrist.—The thirty-five cases included in this category were all examples of partial excision. In twenty-seven, the ends of the radius or ulna, or of both, were removed, and, in some instances, shattered fragments of the upper row of carpal bones. In eight cases, the greater part of the carpus was encised. Death took place from pyæmia, and twice from exhaustion from protracted suppuration and irritative fever; twenty-six cases are reported as recovered. In two cases, amputation of the forearm became necessary. The reports are unsatisfactory in relation to the amount of mobility left in the hand, and the cases are now under investigation with reference to this point. p. 54.

Excisions of the Elbow.—The returns from three-fourths of the entire period give 315 cases of excision of the elbow, and the results are ascertained in 286 cases. In sixteen cases, amputation of the arm became necessary; sixty-two cases terminated fatally, or 21.67 per cent., which is a mortality a fraction greater than that resulting from amputation of the arm. p. 55.

Excisions of the Shoulder Joint.—Nearly all of the cases that have been reported during the war have been recorded. The following are the results: In 252 primary operations, fifty died, 160 recovered, and in forty-two cases the results

are undetermined; in 323 secondary operations, 115 died, 183 recovered, and in twenty-five the results are still undetermined.

The percentage of mortality is 23.3 in primary cases, 38.59 in secondary cases, or a mean ratio of 32.48 per cent. in the aggregate of 575 operations.

The ratio in amputations at the shoulder joint is 39.24, a per centage of 6.76 in favor of excision.

Of thirty-six cases of gunshot fractures of the head of the humerus, selected as favorable cases for the expectant plan, and treated without excision or amputation, sixteen died, or 44.4 per cent., a ratio in favor of excision of 11.96 per cent. p. 55.

Generally the operation has been done in cases in which the head of the bone was alone implicated, and consisted simply in a decapitation of the humerus. Partial excisions have been seldom practiced. The method commonly preferred was that by a single vertical incision, though some operators raised a V shaped flap, and all endeavored to include the wound made by the ball in the incisions. It is frequently mentioned that the long tendon of the biceps was preserved. In twenty-nine cases, portions of the clavicle, or of the coracoid and acromion processes and neck of the scapula, were excised, as well as the head of the humerus. Only four of these cases terminated fatally, and the average result in the recovered cases was as satisfactory as the ordinary result in decapitation of the humerus. When the shaft of the humerus has been extensively shattered, the United States' surgeons have not been deterred by the prohibition of Guthrie, but have frequently removed the head with even five or six inches of the diaphysis. p. 56.

Excisions of the Ankle Joint.—Of twenty-two recorded cases, eight were excisions of the tibio-tarsal articulation, and the remainder were nearly all ablations of the tarsal bones; of eighteen terminated cases, twelve recovered, and six died. p. 57.

Excisions of the Knee-Joint.—Prior to the present war,

there were but seven recorded examples of excision of the knee for gunshot injury. During the late war, complete excision of the knee-joint has been performed eleven times. Dr. Otis furnishes interesting abstracts of each case; two cases of recovery and nine deaths are reported, the mortality being precisely the same as in the same number of cases reported before the war.

Excisions of the Head of the Femur.—There were on record, previous to the late war, twelve cases of this operation, with one success. Experience having demonstrated the uniform fatality of gunshot fractures of the head or neck of the femur when abandoned to the resources of nature, and the excessive mortality of amputations at the hip-joint for gunshot injury, the highest authorities in military surgery were then unanimous in advising, under suitable conditions, excision of the head of the femur, until, as Baron Hippolyte Larrey expressed it, the experiments of the future proved more discouraging than the experience of the past.

Surgeon Otis gives a tabulated statement of 32 cases of excision of the head of the femur, and from this we gather that 26 deaths occurred, to the three recoveries; one case is reported as doing well, and the result is not stated in the remaining two cases. pp. 61-75.

Excisions in the Continuity of the Long Bones of the Extremities.—The great Surgeons who have done most toward substituting excision for amputation in gunshot injuries of the joints have almost unanimously condemned excisions of the continuity of the long bones in the treatment of gunshot fractures. The surgical histories of the Crimean war, of the Schleswick-Holstein campaigns, and of the Italian mutiny, record a few successes in resections of the shafts of the humerus, the tibia, and the bones of the forearm; but this class of operations could scarcely be considered as admitted among the established and approved procedures of Surgery. The late war has furnished ample materials for arriving at definite conclusions on this subject,

and for determining how far these measures can claim to be included in that true conservatism which has for its first object the saving of life, and refuses to jeopardize lives in order to save limbs.

These materials are yet to be thoroughly analyzed. So far as examined, their evidence is, on the whole, unfavorable to incisions in the continuity.

A synopsis of the results at present attained is presented in the following table:

TABLE, giving the number of Cases of Excisions for Gunshot Injuries in the Continuity of the Bones of the Extremities, from the Commencement of the War to July, 1864, *and the Results as far as ascertained.*

	Died	Recovered	Amputa'n ultimately required	Result not yet determined	Total	Percent. of mortality in finished cases
Excisions in the Continuity of the Humerus	42	133	7	79	261	24.00
Excisions in the Continuity of the Radius	11	93	3	67	174	10.57
Excisions in the Continuity of the Ulna	16	100	3	51	170	13.79
Excisions in the Continuity of both Radius and Ulna	5	24	1	10	40	17.24
Excisions of the Metacarpal Bones	2	30	..	18	50	6.25
Excisions in the Continuity of the Femur	32	6	..	24	62	84.21
Excisions in the Continuity of the Tibia	11	48	5	20	84	18.64
Excisions in the Continuity of the Fibula	15	60	3	15	93	20.00
Excisions in the Continuity of both Tibia and Fibula	1	4	1	2	8	25.00
Excisions of Metatarsal Bones	5	26	..	2	33	19.23
TOTALS	140	524	23	288	975	26.71

After excisions of portions of the shaft of the humerus for gunshot fractures, a number of patients have certainly obtained very useful limbs. But the mortality after the operation is 3 per cent. greater than after amputation of the arm.

Excision in the continuity of both bones of the forearm has a larger mortality ratio than amputation of the forearm.

The specimens at the Museum and the records afford emphatic arguments against formal excisions of the shaft of the femur. With one exception, the few cases that recovered were those in which, after the removal of detached fragments, the least amount of operative interference had been practiced.

The mortality rate after excisions of the tibia and fibula is less than after amputation, as the statistics stand; but the number of cases in which the result is still pending is unusually large. p. 76-77.

LIGATIONS.

The following table exhibits the number of cases of ligation of the larger arteries, from the beginning of the war to March, 1864:

	No. of Cases Recovered	No. of Cases Died	Total	Ratio of Mortality
Common Carotid	12	37	49	75.71
External Carotid	..	2	2	100.
Subclavian	7	28	35	80.
Axillary	3	21	24	87.50
Brachial	53	11	64	17.18
Radial	12	2	14	14.28
Ulnar	9	2	11	18.18
Common Iliac	..	3	3	100.
Internal Iliac	..	2	2	100.
External Iliac	2	14	16	87.50
Femoral	25	83	108	76.85
Profunda	1	6	7	85.71
Popliteal	4	12	16	75.
Anterior Tibial	11	5	16	31.25
Posterior Tibial	13	6	19	31.57
Peroneal	..	2	2	100.
All others	11	4	15	26.66
AGGREGATE	163	240	403	..

pp. 78-79.

We pass by the division of this report "on the Medical Staff and the Meteria Chirurgica," and conclude with the observations of Surgeon Otis on Anæsthetics. There have been consulted, in regard to the employment of anæsthetics, the reports of 23,260 surgical operations performed on the field, or in general Hospitals. Chloroform was used in 60 per cent. of these operations, Ether in 30 per cent., and in 10 per cent. of the cases a mixture of the two was administered.

At the general Hospitals, the greater safety of ether as an anæsthetic was commonly conceded. It was often employed, and no fatal accident from its use has been reported. In the field operations, chloroform was almost exclusively used. The returns indicate that it was administered in not

less than 80,000 cases. In seven instances fatal results have been ascribed with apparent fairness to its use." p. 87.

We hope to review the remaining portion of this Circular, prepared by Assistant Surgeon J. J. Woodward, in the next number of this journal.

The extracts which we have given from the report of Surgeon George A. Otis, present all the important facts which will prove of value to the Surgeons of the late Confederate Army for reference and comparison, in the study and record of their Surgical experience during the recent revolution.

SELECTIONS.

ARTICLE I.

Grand Summary of the Sick and Wounded of the Confederate States Army under Treatment during the Years 1861 *and* 1862.

The immense mass of reports from the Army Medical Corps for the first two years of the war has been carefully winnowed and digested under the supervision of the Surgeon-General, and a general summary laid before Congress at its last session. Necessarily imperfect as these statistics are, they show, at a glance, the herculean labors performed by the Medical Staff. Gathered up as the Army was from homes of peace to meet the throng of the invading enemy, the amount of sickness surpasses anything on record, while the ratio of mortality is far below the usual average. The Medical Department—without resources of any sort—without organization, without hospitals or the furniture to equip them, without transportation, self-depending and almost self-sustaining—assumed the enormous burden which is reached in the accompanying figures, containing a few of the leading diseases of the years 1861 and 1862, and faithfully conducted their task to a satisfactory conclusion. We should be prepared to make every allowance for the many imperfect statements and confused or irregular reports consequent on the confusion attendant on these faithful public officers, whilst fighting manfully, and but half equipped, with such a torrent of disease. In our next issue, when the more complete records of the year 1863 will be presented to the reader, a comparison, not without interest to all, can then be instituted.

GENERAL RESUME.

From all the reports now on file in the Surgeon-General's Office for the years 1861 and 1862, exclusive of the few scattering ones which have reached us from the Trans-Mississippi Department, we are enabled to sum up the sickness and mortality occurring in our Armies, as follows:

Continued Fevers.—Field Reports, 36,746 cases and 5,205 deaths. Hospital Reports, 40,565 cases and 7,020 deaths.

Paroxysmal Fevers.—Field reports, 115,415 cases and 848 deaths. Hospital reports, 49,311 cases and 485 deaths.

Eruptive Fevers.—Field, 44,438 cases and 1,036 deaths. Hospitals, 32,755 cases and 1,238 deaths.

Diarrhœa and Dysentery.—Field, 226,828 cases and 1,696 deaths. Hospitals, 86,506 cases and 1,658 deaths.

Pulmonary Affections.—Field, 42,204 cases, 3,534 deaths, and 4,538 discharges from service. Hospitals, 36,988 cases, 4,538 deaths, and 1,135 discharges.

Rheumatism.—Field, 29,334 cases and 1,142 discharges. Hospitals, 30,438 cases and 700 discharges.

Gun-shot Wounds.—Field, 29,569 cases, 1,623 deaths, and 493 discharges. Hospitals, 47,724 cases, 2,618 deaths, and 742 discharges. Killed in battle, 8,087.

All other Diseases.—Field, 324,321 cases and 2,278 deaths. Hospital, 123,402 cases and 1,802 deaths.

Whole number of cases exhibited in the Field Reports during 1861 and 1862 was 848,555; of which 16,220 died and 10,455 were discharged from service. There were admitted in Hospitals, for the same period, 447,689 cases; of which 19,359 died and 6,485 were discharged.

We learn, also, from these Reports that of all the cases represented as originating in the field, but 108,068 were sent to General Hospitals. If this be so, the large number received into Hospitals, as shown by their own returns, can only be accounted for in the repeated transfer of patients during convalescence from one Hospital to another.

It is greatly to be regretted that the interest naturally felt in medico-vital statistics, when based on accurate and reliable data, can scarcely be claimed for what is offered in this paper. Still, if it have but the effect of directing the attention of Medical officers more closely and carefully to the reports required of them, it will not be altogether without good results. This is but a beginning, and the next Annual Report, that for 1863, will doubtless embody many facts of a much more useful and interesting character.—*Confederate States Medical and Surgical Journal, September*, 1864.

ARTICLE II.

Gun-Shot Wounds—Army of Northern Virginia. An Extract from a Report on the Sickness and Mortality in the Armies of the Confederate States for 1863. By F. Sorrel, Surgeon and Inspector of Hospitals.

GUN-SHOT WOUNDS.

The proportion of these was less than that of last year by two per cent.; that is to say, while gun-shot injuries, during the period covered by the Report of last year, amounted to 9.8 of the whole number of cases reported, for 1863 they only reach 7.7. It will be remembered that the campaign of 1862 was conducted with the utmost vigor, and that the army fought, in quick succession, many sanguinary battles, commencing with that of Williamsburg, and ending with that of Fredericksburg; including between these two the battles around Richmond, Cedar Mountain, Manassas and Sharpsburg, each of which resulted in a heavy list of casualties to the troops engaged.

The mortality from these causes, as might be expected, was not nearly so great during this year as it had been during the one previous. The men had become hardened and better able to resist the influence of climate and exposure, and the battles which occurred during the year, transpired at a season far more favorable to recoveries. Thus, instead of being crowded together in hastily extemporised Hospitals during the intense heats of mid-summer, as they were in 1862, the battle of Chancellorsville, fought early in May, gave to its wounded the benefit of a most delightful and salubrious season for treatment and recovery, while that of Gettysburg, still later, sent to our Hospitals the more slightly wounded, leaving the grave cases in the hands of the enemy to die, or to be otherwise accounted for in a manner not known to our reports.

The Surgical Operations performed on the field at Chancellorsville did remarkably well. Generally, the wounded reached the Hospitals in this city in a condition favorable to recovery, and, as before stated, the excellent condition of our Hospitals seemed to repress all tendency to the prevalence of Erysipelas or Gangrene. Indeed, never before or since have they been so entirely free from the presence of these diseases, as they were during the Summer and Fall of this year.

In the Hospitals, the mortality from wounds during the year 1862, amounted to 11.2; in 1863, to 2.3; and this difference is really increased still further in favor of the latter year, by the fact that the wounded from the battle of Fredericksburg gave most of its mortality to the year 1863, without adding at all to the number of cases for that year—these having been already embraced in reports for 1862.

The figures, as we have them in our Reports for this year, exhibit 42,885 cases of Wounds treated in Hospitals, and 999 deaths—this yields a mor-

tality of 2.3. But, in order to arrive at a more accurate estimate of the proportion really dying from Wounds in the Hospital, it will be well to assume that the number reported from the field were all that were treated in Hospitals, and this being 27,206, and the mortality 999, we have a per centage of 3.7, which, it is believed, approaches nearer the truth.

Adding the number dying in Hospitals to those reported from the field, we have an aggregate of deaths for the year in field and in hospital, from Gun-shot Wounds, of 1,723, or 2.4 of the whole number of cases reported.

This, however, is much too small, because it is impossible, as before stated, with our present form of Reports, to avoid the frequent multiplication of cases by transfer, etc.

During this year, one case of successful Amputation at the hip-joint was reported. It occurred on the person of James Kelly, Private Company "B," 56th Pennsylvania, aged 23, and by occupation a Farmer. He was wounded April 29th, 1863, near Fredericksburg, sustaining Compound Comminuted Fracture of the Femur. Disarticulation, by antero-posterior flaps, was performed the same day on the field. He fully recovered, was paroled and sent North, July 14th, 1863. (Operation performed by Surgeon E. Shippen, U. S. A.)

It is proper to remark, also, in this connection, the many successful cases of Amputation, especially of the upper-third of the thigh, occurring in our Reports. Among them may be mentioned Lieutenant-Generals Ewell and Hood (the latter now General Commanding Army of Tennessee), both of whom have been restored to duty, in the full vigor of health, with thighs amputated just a little short of the hip-joint. Added to these are many others, of less distinction, it is true, but not the less attesting the skill and ability of Confederate Surgeons in the performance of an operation regarded heretofore as almost uniformly fatal. Indeed, so much had this come to be regarded the case, that recently an order emanating from the Federal Surgeon-General, forbids such operations on the field, not only at the upper-third, but any where along the continuity of the thigh.

This question of Conservative Surgery in Compound Fractures of the Femur, is one which is receiving the most earnest attention of Military Surgeons, and though it has been to some extent, decided in the United States, we are obliged, in balancing the merits of the two methods of treatment, to adopt a different opinion. With us, the results, as elicited from our Reports, exhibit a slight per centage in favor of the operation itself on the field. Thus, of 77 cases of Primary Amputation of the Thigh, at the upper-third, 40 recovered, and 37 died. The same favorable results are also found to have attended the Conservative Method of treatment in similar cases; for, of 221 cases, where Amputation was not resorted to, 116 recovered.

These results are, indeed, remarkably favorable; far surpassing, in this way, any heretofore reported or known to the Profession.

As between the two modes of treatment, the difference in the results is but slight, as shown by the figures given above, and as will be more perfectly understood when the tables annexed shall be examined. Guided, then, by our Reports, it may be safely accepted as a rule, that the better plan, in general, is to operate on the field. The greater readiness with which the patient can be transported from the field; the greater ease and comfort realized, under these circumstances, when the limb has been removed; the lesser time required in Hospital for recovery, would all seem to point to its adoption as the wiser policy. Still, in these and in all other questions of Surgical interference, the Medical Officer should be governed by the peculiar circumstances attending each case.

Many *Resections* were performed during this year, and while, in very many instances, with results altogether favorable, so far as recovery alone is considered, yet, we are inclined to think, in nearly all cases, leaving limbs of very doubtful utility. Indeed, when it is considered that these operations are much more fatal than simple Amputations, exposing the patient for a much greater time to the evil influence of Hospital atmosphere; involving, more frequently, too, attacks of Erysipelas, Gangrene, and Pyæmia, it may be well questioned if our Surgeons do not too often resort to them.

The shoulder joint, we sometimes think, is the only one in which Resection promises all the good results claimed for it. In the elbow, if the entire joint be removed, no possible effort of nature can supply the lost motion; and the slight prehensible power of the fingers, which may continue, can scarcely atone for the awkward, useless and ungainly limb remaining.

Exsection of the knee joint we cannot help regarding as positively reprehensible on the field, and scarcely less so in Hospital. But one successful case is reported during the year (Surgeon J. B. Read), at last accounts (September, 1864) the patient was fully recovered, but with a limb shortened by several inches, and union only ligamentous. Amputation has been asked for by him, and will be performed as soon as the condition of his health may justify it.

One successful case of Resection of hip joint has likewise been reported by Surgeon J. B. Read, and though the leg will never be of any use, yet it is fair to say, that to this operation may be due the preservation of the patient's life, which might have been more seriously imperilled by disarticulation.

Frequent cases of Gun-shot Wounds, healing by first intention, have also been reported. It is difficult to understand how this can be so, when all our theories of repair and restoration of lost tissues have been based on inflammatory action, leading, of course, to suppuration and granulation. Still, the evident care and truthfulness which accompany the report of the cases attest the fact beyond all doubt; and it is hoped that future investigations on the part of the Medical Staff will, in time, yield much that is interesting and instructive in this connection. Already, it has been

proposed (by Surgeon J. J. Chisolm) to convert all Gun-shot Wounds into simple incised wounds, by paring the ragged edges and nicely adjusting the lips by means of sutures or straps, excluding the atmosphere, and thus effecting a cure by absorption and re-modelling, without the aid of suppuration.

TETANUS.

In reviewing carefully all the circumstances connected with Gun-shot Wounds, as exhibited in the Reports before us, it would be singular did we not remark the occasional occurrence of Tetanus.

This complication of Gun-shot Wounds, so obscure, so fearfully fatal, and so much to be deplored, is fortunately seldom met with. Indeed, it has always been a source of wonder to all writers on Military Surgery that it so rarely occurs. In our Reports for 1861 we find that in 1,750 cases of wounds of different characters, there were thirteen cases of Tetanus—0.75, or one case of Tetanus in 134 cases of Wounds. Of these, only three are reported as having ended fatally, giving a ratio of mortality ot 2.3, or one death in four cases—a result which clearly proves the inaccuracy of our earlier Reports.

In 1862, the consolidated Reports from Hospitals, present 45,974 cases of Wounds, and only 53 cases of Tetanus—0.11, or one case of Tetanus in 867 cases of Wounds. Of these 53 cases, 28 terminated in death—52.8, about one death in two cases, a much larger per centage of mortality than in 1861—but still we have reason to suspect, very much below the truth. Many of the cases reported Tetanus are, doubtless, mere cases of Tramautic Spasms; hence, such apparently favorable results.

Tetanus was, doubtless, of more frequent occurrence in our Hospitals than would appear from the Reports, as it is well known that cases are generally reported under the disease they first enter with, which ordinarily is "Vulnus Sclopeticum." It is only recently that Surgeons have been reporting "supervening diseases." In referring to our special reports ot gun-shot injuries involving Tetanus, covering the whole period of the war up to the present time, and which are evidently drawn up with great care, we find 66 cases recorded. Of these, six only recovered, giving a mortality of nearly 91 per cent.

Assuming, then, that these constitute the entire number of cases of decided Tetanus which have occurred on the whole number of Gun-shot Wounds treated (56,775), we have the proportion of one case of Tetanus to every 860 cases of Gun-shot Wound.

McLeod, in his Surgery of the Crimean War, does not give the proportion of Tetanus to wounds, but he says he could only hear of thirteen cases of Tetanus in the English army throughout the Crimean War. These were all fatal—with only one exception. In the last East India War, nineteen cases are reported, and only one recovery. Alcock gives the proportion of cases ot Tetanus to wounds as one in seventy-nine. Stromyer states, that during the Schleswig-Holstein War, the proportion was three in 1,000. In 1830, of three hundred and ninety cases of Gun-

shot Wounds, there was only one case of Tetanus in the *Hotel Dieu* at Paris.

The following tables will exhibit the general results of amputations and resections thus far collected, and carefully prepared from reports throughout the Confederacy:

RESECTIONS.

	Shoul'r	Elbow	Wrist	Hip	Knee	TOTAL
Primary—						
Successful	28	22	2	..	..	52
Unsuccessful	13	3	..	..	2	18
Secondary—						
Successful	20	23	1	1	1	46
Unsuccessful	7	6	..	1	1	15
Useful Joints	2	7	..	..	..	9
TOTAL	70	61	3	2	4	140

DISARTICULATIONS.

	Shoul'r	Elbow	Wrist	Hip	Knee	TOTAL
Primary—						
Cases	54	3	5	1	2	65
Deaths	25	1	2	2	3	33
Secondary—						
Cases	9	2	..	..	..	11
Deaths	20	1	..	..	6	27
TOTAL	108	7	7	3	11	136

AMPUTATION OF THIGH.

	Upper Third		Middle Third		Lower Third		TOTAL.
	Cures..	Deaths..	Cures..	Deaths..	Cures..	Deaths..	
Circular—							
Primary	19	11	33	14	42	27	146
Secondary	3	7	7	14	12	21	64
Flap—							
Primary	6	4	15	10	35	11	81
Secondary	3	1	3	9	5	5	26
Method not stated—							
Primary	15	22	24	21	35	27	144
Secondary	4	16	5	19	14	35	93
TOTAL	50	61	87	87	143	126	554

COMPOUND FRACTURE OF THE THIGH TREATED WITHOUT AMPUTATION.

	Recoveries	Deaths	Days	Inches
	116	105	..	..
Average Period of Recovery	..	..	104	..
Greatest Period of Recovery	..	..	255	..
Least Period of Recovery	..	..	41	..
Average Period of Death	..	..	52	..
Greatest Period of Death	..	..	185	..
Least Period of Death	..	..	1	..
Average Amount of Shortening	..	..	..	1.9
Greatest Amount of Shortening	..	..	..	5.0
Least Amount of Shortening	..	..	..	0.5

CONSOLIDATED TABLE OF AMPUTATIONS.

	PRIMARY				SECONDARY			
	Cases	Cures	Deaths	Per cent.	Cases	Cures	Deaths	Per cent.
Thigh	345	213	132	38	162	43	119	73
Leg	314	219	95	30	150	76	74	49
Arm	294	252	42	14	140	87	53	37
Fore-Arm	69	61	8	12	45	35	10	22
Shoulder-Joint	79	54	25	31	28	8	20	71
Elbow-Joint	4	3	1	25	3	2	1	..
Wrist-Joint	7	5	2	28	..	..	..	..
Hip-Joint	3	1	2	66	..	..	..	..
Knee-Joint	5	2	3	60	6	..	6	100
Ankle-Joint	6	4	2	33	4	4	..	..
Tarsal-Joint	16	13	3	19	8	7	1	12
TOTAL	1142	827	315	27	546	262	284	51

[*C. S. Med. & Surg. Jour., Oct.,* 1864.

ARTICLE III.

Amputation, Disarticulation and Resection Statistics of the Confederate States Army.

Amputations of the Thigh, whole number, 507: Primary, 345; Recovered, 213; Died, 132; 38 per cent. Secondary, 162; Recovered, 43; Died, 119; 73 per cent.

Amputations of the Leg, whole number, 464: Primary, 314; Recovered 219; Died, 95; 30 per cent. Secondary, 150; Recovered, 76; Died, 74; 49 per cent.

Amputations of the Arm, whole number, 431: Primary, 294; Recovered, 252; Died, 42; 14 per cent. Secondary, 140; Recovered, 87; Died, 53; 37 per cent.

Amputations of the Fore-Arm, whole number, 114: Primary, 69; Recovered, 61; Died, 8; 12 per cent. Secondary, 45; Recovered, 35; Died, 10; 22 per cent.

Disarticulations, whole number, 135: Primary, shoulder-joint, 79; Recovered, 54; Died, 25; 31 per cent. Primary, Elbow-joint, 4; Becovered, 3; Died, 1. Primary, wrist-joint, 7; Recovered, 5; Died, 2. Primary, hip-joint, 3; Recovered, 1; Died, 2. Primary, knee-joint, 5; Recovered, 2; Died, 3. Secondary, shoulder-joint, 28; Recovered, 8; Died, 20; 71 per cent. Secondary, elbow-joint, 3; Recovered, 2; Died, 1. Secondary, knee-joint, 6; Died, 6.

Resections, whole number, 130: Primary, shoulder-joint, 41; Recovered, 28; Died, 13; 27 per cent. Primary, elbow joint, 25; Recovered, 22; Died, 3. Primary, wrist-joint, 2; Recovered, 2. Primary, knee-joint, 2; Died, 2. Secondary, shoulder-joint, 26; Recovered, 19; Died, 7; 21 per cent. Secondary, elbow-joint, 29; Recovered, 23; Died, 6.

Secondary, wrist-joint, 1; Recovered, 1. Secondary, hip-joint, 2; Recovered, 1; Died, 1. Secondary, knee-joint, 2; Recovered, 1, Died, 1.

Amputations of the Foot: Primary—Chopart's, 16; Recovered, 13; Died, 3—Symes', 2; Recovered, 2—Pirogoff's, 4; Recovered, 2; Died, 2. Secondary—Chopart's, 8; Recovered, 7; Died, 1—Symes', 4; Recovered, 4 (1 unsuccessful, requiring subsequent amputation above the ankle-joint.)

A vast number of additional operations are received, but without positive results, and, therefore, they have not been included in the above list.

We may be well satisfied with the results of these statistics, which, carefully excluding all doubtful cases, are compiled from those operations only that have reached a positive conclusion. A general summary of the above tables shows that the mortality after 1,814 operations, including amputations, resections and disarticulations, amounted to 632, giving a death ratio of 34 per cent.

By referring to the mortality tables after amputations, subsequent to many of the great battles of modern days, taken from the pages of Lagouest, which will be found in our chronicle for this number, the reader will be able to draw his own comparisons.

The only statistics on this subject from the Federal army we find in the *United States Army and Navy Journal* for November, 1863, which gives the amputation statistics for September, October, November and December of 1862, as follows: Whole number, 1,342; deducting 516 under treatment January 1, 1863—826. Of this number, 336 died; a mortality of 40 per cent.

The journal to which we owe the above observation gives the following table: Whole number, 1,342; Returned to Duty, 100; Furloughed, 25; Deserted, 11; Discharged, 350; Died, 336; Secondary Operation, 34; Under Treatment, January 1, 1863, 516.—*C. S. Med. & Surg. Journal, May*, 1864.

ARTICLE IV.

Conservative Surgery in Compound Fracture of Femur.

The Military Surgeon has no question submitted to his discretion of more importance than to determine upon the propriety of amputation in compound fractures of the Femur, the result of Gun-shot Wounds.

The authorities, both French and English, teach us not to trust these cases to nature, and broadly state that, in the operation alone, there is hope; but the statistics, particularly of the Crimean campaign and in our own service, prove that the mortality after amputation is enormous, and force us to consider the propriety of conservative practice in this numerous class of surgical accidents.

In various numbers of the *Journal*, the reader will find many interesting observations bearing upon this question, and we submit at this time a consolidated statement of compound fractures of Femur treated without operation, compiled from the records in the Surgeon-General's Office, from June, 1862, to February 1, 1864, inclusive. We have, in summary, excluded all cases not positively determined, and hence, while the number of observations is greatly reduced, the value of the conclusion is increased in like proportions.

Total number of cases, 221: Recovered, 116; 52 per cent.

Average period of recovery, 104 days—greatest period, 255 days, and least, 41 days. Average period where death occurred, 52 days—greatest period, 185 days—least, one day. Average amount of shortening, 1 9-10ths inches—greatest, 5 inches, and least, half an inch.

When we compare directly the results of amputations with the table of cases not operated on, we feel still more disposed to rebel against the authority of Guthrie, McLeod, Larrey, Percy and Dupuytren, and at least hesitate before condemning the shattered limb to instant ablation. Our own statistics are as follows:

507 cases amputated; 250 recovered; 50 per cent.

221 cases *not* amputated; 116 recovered; 52 per cent.

The chance for life being more than equal, the value of the leg saved should be considered, and the table throws important light on this point —the average shortening is less than *two inches*.

Submit these facts to an intelligent soldier—" your thigh is broken by the ball—your chances of life are even, whether amputation is performed or not—without the operation, if you live, you will suffer an average of 104 days—if you die, it will take 52 days—and when you recover, you will have a leg two inches shorter than the other." It is easy to imagine his reply to this simple statement of the facts—" Give me a chance for life *and* limb."

The very important remarks on this subject from the most recent French authority on Military Surgery, published in the chronicle for this number, corroborate forcibly the position which is assumed in this article. The reader's careful attention is called to this interesting translation, but for the sake of condensation, we group his statistics with those collected from various sources during the war.

Legouest.

1,664 cases amputated; Recovered, 123; 7 per cent.

337 cases not amputated; Recovered, 117; 31 per cent.

Chimborazo Hospital Statistics—first and second numbers of this Journal.

31 cases not amputated; Recovered, 19; 61 per cent.

These observations bring us to conclude, that whenever, in compound fracture of Femur, the result of Gun-shot Wound, there is no doubt as

to the propriety of amputation, that we give the leg the benefit of the doubt—the chances of life being at least equal, and the value of the limb, after recovery, being worth the effort to save it.—*C. S. Med. & Surg. Jour., June,* 1864.

ARTICLE V.

Cases of Gun-shot Injury Requiring Ligation of the Artery. [From Reports in Surgeon-General's Office.] Collated by H. L. THOMAS, M. D.

Carotid.

Case 1.—B. Creecy, company "E," Forty-Second Virginia Regiment, wounded May 3, 1863, by a Minie ball, passing through the larynx above the vocal chords and carrying away the epiglottis. The common carotid of the left side was ligated on the 12th for excessive arterial hemorrhage. No chloroform could be administered. Patient fainted during the operation. On the morning of the 18th the right common carotid had to be ligated. Patient died thirty-eight hours after second operation. No brain symptoms supervened, and the heat of the head was retained. Autopsy: the hyoid artery of the left side was wounded; both carotids had been effectually secured.

Case 2.—J. W. Jones, Company "E," Twenty-First Mississippi Regiment; wounded May 3, 1863; ball entering left ear, fracturing the superior maxillary bones, and escaping at the right angle of the mouth. The wound began to slough on the 3d of June, and on the 5th, 6th and 7th hemorrhage occurred. Carotid artery was tied on the 7th, and patient died same day.

Case 3.—Richard Kelley, Company "C," Sixth Louisiana Regiment; wounded July 3, 1863. Division of external carotid by Minie ball. Common carotid ligated July 13, 1863. Left at Williamsport, Md.

Case 4.—Moses Hutts, aged 35. The lower jaw was badly shattered, and the tongue injured. The right common carotid was ligated June 7th; hemorrhage did not recur; patient died on the 8th.

Case 5.—J. H. McGuire, Company "K," Twenty-Fourth Mississippi Regiment; wounded September 26, 1863. Ball entered lower portion of the left mastoid process and lodged. Ligation of common carotid artery at upper third, October 10th, 1863. Died on the 24th inst.

Case 6.—Daniel Shockley, Company "I," One Hundred and First Indiana Regiment; was wounded September 20, 1863, by a round musket ball entering the face about an inch from the corner of the mouth, passing downwards and backwards, across the upper part of the neck, badly fracturing the lower jaw in its passage. The ball was extracted near transverse process of third cervical vertebra. The patient had hemorrhage from the entrance wound amounting to one quart on the 25th of

September; hemorrhage recurred again on the 30th. Three other hemorrhages, of October 6th, 9th and 10th, respectively, so reduced the strength of the patient that the common carotid artery was ligated. The ligature separated on the 29th of October. Recovery perfect.

Case 7.—M. W. Smith; wounded May 5, 1864; ball entered the left temple just above zygoma, ranging downwards and backwards beneath the ear and immediately under the mastoid process, and passing out through the soft parts of the neck. On the 12th of May secondary hemorrhage supervened, which was controlled by pressure. It occurred from day to day until the 21st, when the common carotid was ligated. The hemorrhage was controlled, but the condition of the patient was anæmic, and he died in twenty-four hours, evidently from the want of supply of blood to the brain.

Case 8.—E. F. Lilley, Company "G," Eighth Texas Cavalry, aged 24; was wounded May 9, 1864, by a Minie ball in the face. Secondary hemorrhage, to the extent of one pint, occurred on the 16th, apparently from wound in right side of the mouth. At six o'clock, P. M., there was a repetition of the hemorrhage, amounting to about three pints, from same point. The right primitive carotid was ligated in the inferior triangle, in the usual way, and with very little additional loss of blood. Chloroform was not used, and the patient bore the operation well. The operation was successful to the extent of arresting the hemorrhage, of which there was no recurrence. The patient died May 16, 1864, with well marked cerebral symptoms.

Case 9.—G. W. Nelson, Company "K," Twelfth Georgia Regiment; was wounded June 6, 1864, the ball entering posteriorly to left ear, passing upwards and forwards, and emerging at the infra-orbital ridge, fracturing the zygoma. The wound was extensive, and the hemorrhage considerable. The cavity was plugged after the removal of loose bone, but the hemorrhage returned the next day, and the external carotid was ligated. Hemorrhage recurred two days successively, in the last instance produced by patient's tearing off the dressings in his sleep. The patient died on the 19th.

Subclavian.

Case 1.—Corporal G. M. Caughman, Company "K," Thirteenth South Carolina Regiment, aged 25; wounded July 3, 1863, the ball passing through upper part of the chest, wounding the lung and the subclavian artery where it passes between the clavicle and first rib. The subclavian was ligated on the inner side of the clavicle. The operation was successful; the patient was furloughed, with the wounds entirely healed, but with the left arm paralyzed.

Case 2.—J. H. Kitrell, Company "D," Third Tennessee Regiment; wounded July 12, 1863, the ball fracturing humerus, and primary amputation being performed through surgical neck. The stump was progressing well until July 20, when slight hemorrhage occurred, which was controlled

by pressure. Hemorrhage recurred again on the 28th, and digital pressure was diligently applied up to August 2d, when the hemorrhage again took place more copiously than ever. Effort was then made to expose the bleeding vessel by tearing open the flaps, but the adhesions were too firm, and, the hemorrhage proceeding from two points, it was determined to ligate the subclavian at its third division. The patient, under chloroform, bore the operation well, but required stimulation, having lost largely of blood from the stump, but none from the operation itself. The separated flaps re-adhered, and the ligature came away on the 4th of September. The patient was furloughed the latter part of the month.

Case 3.—John T. Endy, Company "F," Fifth North Carolina Regiment, aged 23; wounded July 2, 1863, the ball entering one-and-a-half inches below the scapula, ranging forwards, but having no exit. There was great tumefaction and effusion about the shoulder, while the wound under the deltoid region was filled with clots of blood. Hemorrhage supervened on the morning of the 16th, but was controlled by pressure and styptics; it occurred again the evening of the same day, and was controlled in like manner. On the morning of the 17th, very profuse hemorrhage took place, which could only be controlled by pressure over the subclavian artery. Exploring the wound failing to detect the bleeding vessel, it was determined to ligate the subclavian in its third division. The operation was performed without any untoward accident, but, while the hemorrhage was lessened, the flow of blood could not be entirely arrested in the wound, even with the assistance of styptics; it was therefore decided to ligate also the suprascapular artery, which had been exposed in the operation; this being done, the hemorrhage immediately ceased. The patient was put to bed with the arm warmly wadded, and at night there was sufficient temperature in the parts below the seat of ligature. The ligature from the suprascapular came away on the tenth day, and that from the subsclavian on the thirteenth day. The patient got well without any bad symptom, and was furloughed on the 31st of August. The ball was not discovered.

Case 4.—W. S. Averitt, Company "H," Fourteenth Tennessee Regiment; wounded August 9, 1862. Arm amputated just below surgical neck. Excessive hemorrhage having supervened, the subclavian was ligated at usual point. Died January 26, 1863.

Case 5.—A. C. Howard, aged 19; wounded May 31, 1862. Ball passed through left shoulder, injuring the spine and producing paralysis. June 7—ligation of subclavian artery in consequence of hemorrhage. Died June 18.

Case 6.—J. W. King, Company "C," Twenty-Ninth North Carolina Regiment; wounded September 19, 1863, the ball passing through shoulder joint, fracturing and detaching head of humerus. The ball entered near the coracoid process and passed out over the spine of the

scapula. The accident was followed by a high degree of swelling and inflammation, extending from the seat of injury down the forearm; suppuration copious and offensive, with high irritative fever. On the 10th of October there was hemorrhage from the anterior wound, which was arrested by pressure; on the 11th, the hemorrhage recurred copiously from both wounds, and the subclavian was ligated in its external third. There was no further hemorrhage, but gangrene attacked the wound of operation on the 20th, and the patient died the next day.

Case 7.—Result fatal. [This case is reported in full in the February number of the *Journal*, by Surgeon Browne.]

We give below a tabular statement of the rest of the cases of ligation, including those detailed above:

VESSEL	Cases	Recovery	Death	Undetermined
Carotid	9	1	7	1
Subclavian	7	3	4	0
Axillary	7	2	5	0
Brachial	43	30	5	8
Arteries of Forearm	16	14	1	1
Femoral	53	24	24	5
Profunda	3	1	1	1
Popliteal	2	1	1	0
Arteries of the Leg	11	5	4	2
All others, including Facial, Temporal and Occipital	6	3	3	0
TOTAL	157	84	55	18

In giving the above report, it is not pretended to include all the ligations performed, but simply all that have been reported. Medical officers can look over it and see to what an extent the deficiency lies at their own doors. That the bloody work through which the army has passed in four campaigns has *demanded* only 157 ligations, and many of these of only a trivial vessel, is an estimate which cannot be adopted. Certainly more operations of this character have been performed, for the number reported does not bear a respectable ratio in the chapter of gunshot accidents. The presumption is, they have not been reported, and are sleeping in the *case-books* of the Hospitals. Gentlemen may see to what a desirable use full reports of each special branch of surgery may be put—namely, the laying of them before the profession at large, and especially before those officers whose experience has not yet brought them in contact with such cases.

Even in many of the reports the data are so meagre as not to furnish any satisfactory conclusion with regard to the gravity of the case. Brevity is a very commendable feature in clinical reports, but should not be pushed to the extent of robbing the case of its interest. "Alexander died—Alexander was buried;" but there are some people who would be curious to know how he died and when he was buried; and it is a lean obituary that does not give these small items. Some of the reports, indeed, seem to have been based upon the editorial warning that "funeral notices of more than ——— lines will be charged for as advertisements."

But we are satisfied there is room enough in the Surgeon-General's Office for reasonable and instructive post-obits, and if they are transferred to the pages of this journal, disquisitive platitude may be modestly retrenched, but deficient data cannot be supplied.—*C. S. Med. & Surg. Jour.*, 1864.

ARTICLE VI.

Conservative Treatment of Compound Comminuted Fracture of the Femur. By G. M. B. MAUGHS, Surgeon P. A. C. S.

Case 1.—C. S. Sheffield, private 15th Mississippi Cavalry, aged 17, of feeble constitution, power of reaction very low, was wounded at Tishimingo Creek, June 10th, 1864, transported some thirty or forty miles in an ambulance to Rail Road, and thence in cars some 130 miles, to Lauderdale Hospital, where he was admitted June 15th, 1864; compound comminuted fracture of Femur at juncture of middle and upper third—comminution very severe. Treated by Smith's anterior splint; but little effort at reparation; suppuration excessive. Died August 1st, 1864, of hectic and exhaustion.

Case 2.—M. B. James, private Company "H," First Kentucky Cavalry, aged 19, wounded at Tishimingo Creek, June 10th, transportation as case 1st, admitted in Hospital June 19th, 1864; compound comminuted fracture of Femur at upper third, the ball in its oblique course passed through the bone as high up as the trochanter major. Treated by position; attempted union by free provisional callus; doing well until the middle of August, when he was attacked with continued fever, of which he died September 9th, 1864.

Case 3.—W. H. Ray, private Newsom's cavalry, Company "H," aged 24, wounded at Tishimingo Creek, June 10th, 1864, admitted into the Hospital June 19th, 1864; compound comminuted fracture of Femur at middle third. Treated by Smith's anterior splint; cure perfect; no shortening or deformity.

Case 4.—E. H. Powell, private Newsom's Cavalry, Company "H," aged 49, wounded at Tishimingo Creek, June 10th, 1864, admitted June 19th, 1864; compound comminuted fracture of Femur at middle third. Treated by Smith's anterior splint; recovered with three inches shortening.

Case 5.—W. B. Davis, private Sixth Mississippi Cavalry, Company "F," wounded at Harrisburg July 14th, admitted at Lauderdale Hospital July 18th; compound comminuted fracture of Femur at middle third. Treated by Smith's anterior splint; union perfect; shortened one inch; no deformity otherwise.

Case 6.--D. C. Crouch, private Twentieth Tennessee, Company "F," aged 19, wounded at Harrisburg, July 14th, 1864, admitted July 18th, 1864; compound comminutəd fracture of Femur at middle third; extensive comminution. Treated by Smith's anterior splint; furloughed October 12th, 1864; perfect union; shortened three inches.

Case 7.--J. Posten, private First Kentucky Cavalry, Company "C," aged 18, wounded at Harrisburg, July 14th, 1864, admitted July 18th, 1864; ball passed through both thighs; compound comminuted fracture of left Femur at upper third at trochanter. Treated by Smith's anterior splint; furloughed September 26th; cure perfect; shortening scarcely perceptible.

Case 8.—J. H. Shelley, private Third Kentucky Cavalry, Company "L," aged 20, wounded near Tishimingo Creek, June 9th, 1864, admitted June 14th; compound comminuted fracture of Femur at the juncture of middle and upper third. Treated by position. The cure in this case has been greatly retarded, and the limb rendered useless by the meddlesome surgery to which he was subjected, in incising the soft parts and removing the broken fragments of the Femur. Union complete; will recover with great shortening.

Case 9.—J. W. Martin, private Seventh Kentucky Cavalry, Company "K," aged 19, wounded at Tishimingo Creek, June 10th, admitted June 14th; compound comminuted fracture of Femur at the junction of middle and upper third; extensive injury to soft parts; died June 16th, 1864.

Case 10.—J. L. Lawrence, private Eighth Kentucky, Company "C," aged 25, wounded at Tishimingo Creek, June 10th, 1864, admitted June 14th; compound comminuted fracture of Femur at upper third; died June 16th, 1864.

Case 11.—N. L. McNight, private Fourteenth Confederate Cavalry, wounded at Harrisburg, July 15th, 1864; compound comminuted fracture of Femur at upper third. Treated by long, straight splints; died September 9th, 1864.

Case 12.—N. L. McGoodwin, sergeant-major Third Kentucky Cavalry; compound comminuted fracture of Femur at junction of middle and upper third; extensive comminution. Treated by position; union complete; shortened two and a half inches; wounded at Harrisburg, July 14th, 1864; furloughed September 16th, 1864.

Case 13.—J. T. Tindell, Eighteenth Mississippi Cavalry, Company "K," aged 19, wounded July 15, 1864; compound comminuted fracture of Femur at upper third, the ball passing up to the joint; extensive comminution, wi h great injury to soft parts; died September 18, 1864.

Case 14.—A. Latten, Morgan's Command, wounded at Harrisburg, July 15th, 1864; compound comminutad fracture of Femur at upper third, near hip-joint; injury to bone and soft parts very severe; wound sloughed extensively. Treated by long splint; died of pyæmia September 1st, 1864.

Case 15.—J. Malone, Morgan's Command, aged 21, wounded at Harrisburg, July 15, 1864; compound comminuted fracture of Femur at middle third. Treated by long splint; partial union of bone; wound doing well, when he was taken with pyæmia, and died September 17th, 1864.

Case 16.—V. T. Bynum, Third Kentucky Cavalry, aged 23, wounded at Harrisburg, July 15th, 1864; compound comminuted fracture of Femur at lower third. Treated by position; union complete; shortening two inches; gone home.

Case 17.—J. H. Stevens, Third Kentucky Cavalry, Company "D," aged 20, wounded at Harrisburg, July 14th, 1864; compound comminuted fracture of Femur, upper third; treated by position; had pthisis pulmonalis; died August 3d, 1864.

Case 18.—H. Jenkins, private Company "H," Mississippi Partizan Rangers, wounded at Harrisburg, July 14th, 1864, aged 23; compound comminuted fracture of Femur, middle third; treated by position; cure perfect; shortening scarcely perceptible.

Case 19.—W. T. Ivy, private Nineteenth Mississippi Cavalry, aged 40, wounded at Harrisburg, July 14th, 1864; compound comminuted fracture of Femur, upper third; ligation of arteria profunda; treated by position; union complete; shortened one inch.

Case 20.—W. W. Shophire, Thirty-Eighth Mississippi, Company "D," aged 28, wounded at Harrisburg, July 14th, 1864; compound comminuted fracture of Femur, junction of middle and upper third; very great comminution; attacked with erysipelas; recovered; union complete; shortening one inch; furloughed August 12th, 1863.

Case 21.—Yankee Lieutenant, wounded at Harrisburg, July 14th, 1864; compound comminuted fracture of Femur, upper third; during treatment femoral artery sloughed and was ligated; complete recovery; has been exchanged.

Case 22.—A. Boy, attached to the army, was admitted for wound of Femur, middle third, compound comminuted; treated by position; union complete; but little deformity; gone home.

Here we have twenty-two cases of compound comminuted fracture of the Femur, treated without amputation; not selected to make an argument, but consecutive cases, and include, with a single exception, all the cases so wounded and so treated at these Hospitals, during the time included within this report. And we have not extended the report through a greater time, or hunted up isolated cases because others might have been wounded at the same time, of whom no record was preserved, thereby rendering the statistics incomplete and worthless.

To the statistician, these twenty-two cases are worth more than a thousand would be, gathered up from different sections, where in each section a few cases had been omitted, and the result in others was not known. Such statistics are like native offerings in heathen temples, they tell but a partial story.

The excepted case is that of a private, wounded at Harrisburg by a grapeshot through both thighs near the hip-joint, with great destruction of the soft parts, tearing out the testicles, and bruising the perineum. It was not expected that this unfortunate man could survive even a few days. His testicles were removed, the wounds dressed, and his mangled limbs placed in the most comfortable position; stimulants and nourishing diet were administered. He lived for six weeks, during which time one of the wounds healed up, the bone united, and considerable progress had been made in the other limb, when he sank, worn out with the extensive suppuration.

This case is mentioned and fairly stated to show that it could not have been included with those given in this report, as the object of this paper is not to prove that wounds of the Thigh may not be of such a nature as to require amputation. Would, however, the most reckless advocate of the knife have used it in this case?

Our object is to prove that in all compound comminuted fractures of the Femur, with the artery intact and no very great destruction of soft parts, conservative surgery not only gives the patient the advantages of a natural over an artificial limb, but also gives him a better chance for his life than amputation would. And all of this we think this paper establishes.

Of these twenty-two cases nearly all were subjected to circumstances most unfavorable to recovery. The patients from the Tishimingo battle, treated by Assistant-Surgeon S. Kennedy, were hauled over rough roads for thirty or forty miles, and then transported some hundred and thirty miles by Rail Road, being constantly disturbed and their wounds fretted for eight or nine days before their arrival at Lauderdale Hospital. Several of the patients from the battle of Harrisburg were subjected to nearly the same transportation and frequent change of place; the delay, however, in their arrival at the Hospital was not so great; some of the others were necessarily removed three or four times during their treatment. The Surgeon in charge, Dr. Hoyle, thinks the death of more than one of these clearly attributable to this untoward circumstance. Cases 9 and 10 died soon after their admission, never having re-acted from the shock. Case 17 had pthisis pulmonalis, of which he most probably died; admitting, however, that he did not really die of this, it can not be denied that it rendered his recovery from any serious injury most improbable. Case 2 was progressing favorably when attacked with continued fever, at the time prevailing in the Hospital, of which he died. While, therefore, there would be much justification for excluding cases 2, 9, 10 and 17 from the report, as their deaths were only indireetly the result of their wounds, yet we will give the advocates of amputation the benefit of them.

We have then recovered, cases 3, 4, 5, 6, 7, 8, 12, 16, 18, 19, 20, 21, 22 —total, 13, or 59.1-11 per cent. Died, cases 6, 2, 9, 10, 11, 13, 14, 15, 17—total, 9, or 40.10-11 per centum.

Now, let us see what would have been the result had amputation been performed in all those cases. In cases 2, 7, 13, amputation must have been at hip-joint; disarticulation, all of whom would have died. That a case does now and then survive this formidable operation does not affect the rule that of ten or twenty so operated upon all will die. Dr. Macleod never saw a successful case in Military Surgery. We have heard of but one—that of a private wounded by a shell at Fort Pemberton, and operated upon by Surgeon W. M. Compton, and afterward attended by Surgeon Green in Hospital at Yazoo City.

In cases 1, 8, 9, 10, 11, 12, 13, 14, 17, 19, 20, 21—total, 12—amputation must have been high up in upper third, through or near the trochanters; of these, nine, most probably ten, would have died. In the other seven cases, amputation could not have been lower than the middle third; of these, four would have died, giving for operative surgery, deaths 16, or 72.8-11 per cent.; recoveries 6, or 27.3 11 per cent., or more than 100 per cent. in favor of conservative, under the most untoward circumstances, over operative surgery, under circumstances the most favorable.

And this proportion, we doubt not, but for the meddlesome interference of the Surgeons, would hold good throughout the Confederacy, or even be greatly increased, as it would scarcely happen that a concatenation of circumstances so unpromising would again be met with. It will be observed that in all of these cases, with a single exception, and that greatly to the detriment of the patient, the treatment was eminently conservative. *No* EXCISIONS *of the Femur, no* INCISIONS *of soft parts for the removal of loose pieces of bone*, no formidable display of machinery to keep the limb *in* place and the patient *from* sleep.

The wounds were carefully examined, and all foreign bodies, including spiculæ of bone immediately in the track of the ball, removed. The limb was placed in Smith's anterior splint, or what was preferred, placed in position and retained there by soft cushions or pillows, and all unnecessary probing or handling carefully avoided.

By even late authorities, the experience of the Crimean campaign and Dr. Macleod's observations have been quoted to prove that ordinary fractures from rifle balls, above the knee (of the Femur), demand amputation. These give only eight per cent. recoveries for conservative surgery under the most favorable circumstances, with selected cases, and only thirty-two per cent. for amputation. This is indeed an alarming fatality, and as frightfully dangerous, as it shows amputations of the thigh to be two to one against recovery, as it is four times more successful than conservative treatment, would of course establish the rule to amputate. But against such a rule our paper is an unanswerable demurrer; and as it reverses the *result*, and proves that by saving the limb we save twice as many lives as could be saved by amputation, by the same parity of reasoning it must also reverse the *rule*, and establish this. *As a general rule, ordinary fractures above the knee, from rifle balls, should never cause primary amputation.*—[*C. S. Med. & Surg. Jour., January*, 1865.

ARTICLE VII.

A Summary of Observations on Cholera. By GEORGE SUTTON, M. D., of Aurora, Indiana.

As the pages of the *Reporter* have been open for the opinions and observations of physicians on the subject of cholera, I will present a summary of conclusions which I think can be sustained by conclusive arguments, and which appears to me to explain much of the obscurity which has attended this disease. Some of these conclusions were presented to the Indiana State Medical Society in the year 1853, and are published in the proceedings of the Society for that year. They are based upon an extensive experience with cholera under various aspects—having observed the progress of the disease as it spread through a sparse population in our rural districts, which gives the physician a favorable opportunity of tracing the connection, if any exists, between the different cases that occur—also having seen cholera assume, as it were, a local character, and present its most malignant form in certain small localities within our city, and sweep off more than half their inhabitants; again presenting an opportunity of examining why these localities (which are the most healthy and elevated in our city) should be so severely attacked by the disease—and also having had the experience of being prostrated from a severe attack of cholera myself, and while confined to the bed, see my family stricken down, my son die after only a few hours' illness, and other members of my family reduced to the lowest stage of collapse from which the system could recover—an experience with me in cholera which has led to a careful observation of facts, and an anxious endeavor to unravel and account for the diversity of phenomena which the disease presented, as it prevailed in this section of country.

Physicians have recently presented the theory that cholera-poison may emanate from evacuations, as something new. This theory was advanced by myself in 1853, in the report alluded to (and I am not aware that the theory was ever advanced before), to account for the cause of the disease being so malignant in certain

localities in the city of Aurora. It was shown in that report that the alimentary discharges, from their watery character, were generally emptied upon the ground, and that in one locality the bedding known to have been saturated with the discharges during the last stages of a fatal case which I attended, was thrown upon a vacant lot and became, as I supposed, the first point from which emanated the infection that produced a *local* malignancy to the disease. (See the same Report, pages 162, 163 and 166.) The idea is also advanced in that report, that cholera, like many other diseases, is capable of assuming different grades of violence, and that under the form of a mild diarrhœa, it may be spread over the country by persons who are scarcely aware that they are unwell. (See pages 160 to 175.)

The conclusions which we present may be summed up as follows—and if found not to be altogether correct, we think is an advance in the proper direction:

1st. That cholera is unlike any other disease, and is governed by laws peculiar to itself.

2d. That its cause is an organic poison, which is reproduced within the human system, and is diffused by human intercourse.

3d. That for the development of cholera on this continent, there must first be cholera-poison, next, a community susceptible to its influence.

4th. That the susceptibility to cholera resides in the organic nervous system, upon which the poison first makes its impression, producing innervation and altered action of the capillaries, giving rise, in many instances, to profuse exhalations, also morbid secretions from the mucous membranes, from which probably the infection arises—as we see in hydrophobia, a *nervous disease*, associated with poisonous secretions from the salivary glands or glosso-pharyngeal mucous membrane.

5th. That this susceptibility to cholera is not alike in all persons, but exists to the greatest extent in a community that has never been under its influence.

6th. That temperature, or season of the year, humidity, modes of living, and other local and physical causes, increase or diminish the susceptibility of the community to the disease.

7th. That cholera, like other diseases, may assume different grades of violence, and may also prevail under different forms.

8th. That it may prevail under the form of a diarrhœa. That where predisposition, season of the year, or other causes favor the development of dysentery, that cholera assumes this form of disease. That it may prevail as a mild cholera-morbus, and the malignant form is the name that we would give to those cases where there is failure of the circulation, blueness of the skin, cramps, etc., etc.

9th. That when cholera-poison was introduced upon our continent, in 1832, in the North, and in 1848, in the South, it was the cause of these four forms of disease spreading over the country—in many places intimately associated, and in others appearing only as an *epidemic diarrhœa*—which we consider not merely a "symptom" of cholera, or the "premonitory stage," *but the cholera itself in a milder form.* Why call this diarrhœa that accompanies cholera the premonitory stage, when a large majority of cases proceed no further? And at what period of the attack are we to consider true cholera as commencing?

10th. That the disease may be spread by each one of these forms, and by the diarrhœal form, even if only *one person out of ten* is susceptible to its influence. Consequently, no other disease known can be so easily diffused over the country as cholera, and no other disease so difficult to trace the manner of its diffusion.

11th. That the malignant form of cholera is favored by a variety of causes, among which are predisposition, tendency to diarrhœa, modes of living, mental depression, probably fear, *but more particularly than from any other cause, upon the accumulation of infection,* which overpowers vital resistance before the system has acquired the power to tolerate the disease, as we see from the same cause, in certain malarial districts, a simple disease assuming the fatal and malignant form of congestive fever.

12th. That the principal cause of the accumulation of infection is from the evacuations, which from their watery character are generally emptied upon the ground, and from which the infection is capable of spreading through the atmosphere, and gives a local malignancy to the disease. (See Report to Ind. S. M. S.)

13th. That this accumulation of infection takes place when cholera is introduced under favorable circumstances into large crowds of human beings, or poorly ventilated places, or in cities, or on low damp situations during stillness of the atmosphere—and particularly where the sub-soil is of *clay or limestone formation,* while upon a dry and *sandy soil,* which rapidly absorbs moisture, the infection seldom accumulates. (Pettenkoffer's theory might have some foundation if the disease did not appear so fatal on board our steamboats and ships, thousands of miles from the soil or land, which he considers necessary in connection with the evacuations, to develop the cholera germ.)

14th. That season of the year or temperature has a marked influence upon the progress of cholera, and *that during the Winter it may prevail in our cities as a mild form of diarrhœa,* to re-assume its malignant form as Summer and other causes favor its development.

15th. That the *system soon tolerates the poison,* and that attacks of either of the forms of cholera and frequent exposure to the infection, removes in a great measure the susceptibility to the disease, which is probably acquired again in from 15 to 20 years. This power in the system to tolerate the poison is the reason the disease leaves the country, and seldom attacks a city or town severely the second time.

16th. That when cholera-poison is once introduced upon our continent, the most certain prophylactic in our northern climate (in connection with proper sanitary regulations) *against the malignant form of cholera in the Summer, is frequent exposure under favorable circumstances to the infection during Winter, by which the susceptibility to the disease may in a great measure be removed.* We are well aware that cholera prevailed in Russia, Scotland, and parts of England during the Winter, but we think that these facts, when properly examined, have but little weight against the correctness of our conclusion.

Now we think that we have a very extensive array of arguments to sustain each one of these conclusions, a summary of which, in as few words as possible, we will present at another time; merely stating at present that the first conclusion that cholera as an infec-

tious disease is governed by laws peculiar to itself, we consider as self-evident, and requires no argument, if the other conclusions we present are correct. Physicians tell us that cholera cannot be contagious, because it differs from all other contagious diseases. This assertion, we think, is without foundation, because *we do know* that contagious diseases are governed by different laws—hydrophobia, for instance, is a contagious disease—communicated by inoculation, like small-pox, and capable of reproducing its poison in different species of animals, even in the human system, according to the experiments of MM. Magendie and Breschet; but hydrophobia differs from all other diseases, and is governed by laws peculiar to itself, and differs as much in its nervous symptoms and indefinite period of incubation of its poison from small-pox, as cholera does from other infectious diseases.

Could the virus of hydrophobia rise into the atmosphere like the infection of rinderpest or of small-pox, and many other diseases (and why should it not assume an ærial character?), and produce its specific effects upon the human system through the respiratory organs as it does now by inoculation, it would then in its mode of communication resemble cholera, and be by far a more terrible disease, perhaps the most terrible disease upon our globe, incurable in its nature—communicable to different species of animals, which would reproduce the infection from innumerable sources; and, like cholera, this infection having no *definite period of incubation*, it would be still more difficult to guard against it by quarantine than cholera, and in time, like cholera, it might desolate extensive portions of the globe. By merely changing then the physical properties of the virus of a well known contagious disease, we should have a malady probably more terrible than cholera, which unlike all other diseases, would be then, as it is now, governed by laws peculiar to itself. It is highly probable that future discoveries may show that several theories of the formation of contagion are correct, and that organic poison germs may originate, 1st, from zymotic agents, or poisons which are capable within the blood of re-development. 2d, from *morbid secretions, which by a natural selection for the organs from which they were secreted, cause the reproduction of a similar secretion;*

and also, possibly from morbid secretions becoming poisonous from their union with the elements of matter, either in the earth or atmosphere. Is there anything unreasonable in supposing that certain vitiated secretions, which are probably in the form of cells, when introduced into the blood of another system through the respiratory organs, have a *natural selection or tendency to produce morbid or specific effects on those organs, membranes or cells, from which they were secreted, so as to reproduce a similar secretion* or re-development of poison germs. This action being influenced by an excited or irritated condition of the nervous system of the part, produced by the poison itself—as we know that many of the secretions are excited and changed by nervous influence. That poison germs are reproduced by secretions without the blood being contaminated, is a well known fact—as we see that an application of gonorrhœal poison to a mucous membrane, or the poison of purulent ophthalmia applied to the conjunctiva reproduces a similar poison without poisoning the blood, while in small-pox, measles, scarlatina, and some other diseases, we have the evidence of blood poisoning; and in gonorrhœa, purulent ophthalmia, hydrophobia, cholera, and probably hooping-cough, we have reason to believe that the poison germs depend upon *morbid secretions.* Then again we see the different effects which these specific poisons produce upon *the nervous system,* as in hooping-cough, hydrophobia, and malignant cholera.—*Medical & Surgical Reporter.*

ORIGINAL CORRESPONDENCE.

ARTICLE I.

History of the Dry Culture System on the Rice Lands near Savannah, with Observations on the Effects of Rice Culture upon the Health of this City. By W. C. DANIELL, M. D.

ATHENS, GA., October 2d, 1865.

JOSEPH JONES, M. D., Professor of Medical Chemistry, in Medical College of Georgia: Augusta.

Dear Sir: Some necessary writing and the unusual heat of the Summer have delayed my fulfilment of a promise to supply you with whatever my memory may furnish of the history of the

Dry Culture system on the rice lands near Savannah, first purchased by the city at forty dollars per acre, and afterwards extended by legislative authority and confirmed by the Supreme Court of this State.

It is now my purpose to make such memoranda, from day to day, as my recollections will call up, that I may suppose will interest you.

The idea of getting rid of the rice culture, around Savannah, had been previously agitated, but was fully considered in the early part of 1817 and established in 1818. The late Mr. John Bolton, then an eminent merchant of Savannah, was at the head of the movement, and we owe the establishment of the dry culture system to his perseverance and address.

Some of the proprietors of the land to be subjected to the system accepted the measure in the best spirit, among them was Dr. N. B. Bayard, I believe. One of the proprietors, I think the largest, positively refused to subject his lands to the system—in other words to relinquish the cultivation of rice. He was a Scotchman who had acquired his property by marriage with a wealthy widow, and who did not purpose living much longer in this country; indeed, he removed, some years after, to Scotland. Several of the proprietors, unwilling to sell and equally indisposed to incur the public odium by refusing to concur in a measure so eminently conducive to the health of the city, yielded a conditional assent. They would sell the right to cultivate rice on their own land, provided all (amounting to some eight or ten) would sell. There must be unanimity or a failure of the measure. Mr. Bolton came to the conclusion that this conditional consent was given in the conviction that the Scotchman would adhere to his solemn declaration, so repeatedly made, that under no circumstances would he sell. The measure which the city had so much at heart was to be defeated, and the conditional consent of so many of the proprietors would be unavailing, because of the obstinacy of the Scotchman. He was consequently responsible; on his single head would fall the execrations of an indignant and incensed community, foiled in its efforts, at great cost, to give health to their homes. How, or by what means, I know not, Mr.

Bolton inspired the Scotchman with the conviction that the proprietors who had placed their consent to the proposed measure, on the condition that he would also consent, had done so in the full belief that he would stand by his declaration; and that whilst these proprietors were as opposed to the measure as he was, they had so managed that all the odium of the refusal should fall on him, and they would be held up as willing to do all that the occasion demanded. Once satisfied on that point, in an agony of rage he avowed his determination to defeat and punish the d—d rascals, and yielded to passion and resentment, what neither reason nor the wants of the city could win. Thus are, occasionally, the evil passions of men made the means to accomplish a great good.

In the course of the year the contracts were made and the money paid, and the dry culture system went fully into operation the following year (1818) which was certainly and decidedly the most healthful year I have ever known in Savannah. The late Dr. George Jones, whose father accompanied General Oglethorpe to Georgia, in reply to my inquiry how to account for the number of Charleston names to be found recorded as possessors of city property in Savannah, told me that at an early period, and before the clearing of the tide swamp immediately around the city, Savannah was resorted to as a Summer residence by many Charlestonians on account of its greater healthfulness.

The dry culture system was a measure to restore Savannah to its early salubrity; it was a measure of self defence adopted by the citizens for protection against injury, originating from the pursuits of a few of the citizens, exercised to the injury of the whole community. Instead of rising up in their power and abating the nuisance, the people of Savannah acting under a commendable respect for individual rights, preferred to compensate the proprietors of the offensive culture, and paid to them two-thirds the value of the lands so employed for their right to cultivate rice, conditioned that they should keep their lands well drained and not irrigate them during the warm months.

Some of the proprietors of the dry culture lands, after a few years, became dissatisfied with their bargains, and an effort was

made by application to the city authorities to have them annulled, upon the ground that the change of culture had not proved beneficial to the health of the city, and that it had caused great loss to the proprietors. The latter proposition was doubtless true, but whether owing to the intrinsic qualities of the soil or to want of enterprise and energy of the proprietors, need not be here discussed.

The first proposition was of a different character. It had two sides, an affirmative and a negative, and was of a character to require research, investigation, and analysis. Apparently conflicting facts were to be reconciled by investigating remote and secondary causes; indeed, it was one of those questions which, in this country, every man undertakes to judge of, and of which, not every tenth man is capable of forming a reasonable opinion. Three years had elapsed under the dry culture system. The first had been very healthful; I mean 1818, the only year during my practice there in which I did not see a case of yellow fever. The year 1819 was fatal to strangers who came out in great numbers in the Summer, in consequence of financial embarrassments North. They were chiefly of the laboring class, and were Europeans. 1820 was visited by yellow fever, as an epidemic, and carried off over one-fifth of the white population. The city had been visited by an extensive fire in its heart, and the foreign population which had been constantly pouring in, were necessarily crowded into small houses, and they supplied the main element to fill the bills of mortality.

Whilst, therefore, the proprietors could cite the experience of the three years as proving the inutility of the dry culture system so far as 1819 and 1820 were concerned, the friends of the measure saw nothing in the past to discourage them. The city authorities referred the question of the abandonment of the dry culture system to the citizens. If the proprietors had proffered to return the money received by them in consideration for giving up the culture of rice, I believe they would have prevailed, but they refused this, alleging that their losses had been so great as fully to cover what they had received in payment; as it was, the citizens, by a small majority sustained the system. In speaking

of the proprietors of the dry culture lands, I refer to a portion of them and not to all; some of them, from first to last, yielded their cordial support to the dry culture system. The small majority of citizens by which it had been sustained imposed great caution on the friends of the measure. The dry culture committee of the City Council made occasional reports, censuring the delinquent proprietors, but dared not ask the approval or adoption of them by the board. Appeals were made through the city press to the community against these reports, which only embodied the substance of the Inspector of dry culture reports, and reasoned from them. Of these appeals no notice was taken by the party assailed. It was deemed most wise to let the dry culture system silently work out its own vindication.

Whilst this was going on, some zealous friends of the measure had a prosecution instituted against a citizen of another State, who owned rice land near the city, which he cultivated. I believe no proposal was ever made to him to purchase his right to its culture. The prosecution failed, as had been predicted, and that land is still cultivated in rice. I believe it is farther removed from the city than any tract of land contracted to dry culture.

About eight years after the dry culture system had been in operation, and when the community had become fully assured of its importance to the health of the city, a law was passed by the General Assembly, prohibiting the culture of rice within a specified distance of the city, and its jurisdiction so enlarged as to embrace the dry culture lands, and heavy penalties were imposed on violators of the law. The main purpose of this law was to supply a prompt and efficient remedy against violations of the dry culture contracts, and to repress the culture of rice upon abandoned and recently opened rice lands. Prosecutions were soon after instituted against some violators of the law. They failed, the presiding judge having been taught by learned counsel that the omission of the numeral "one," before "hundred dollars," vitiated the penalty—in other words, that the absence of the adjective nullified the presence of the substantive. This decision led to some curious results; proprietors became partial to the cultivation of rice as a dry culture crop, and most strangely wherever

(or in many cases) rice was so cultivated, such was the affinity of the cherishing mother, water, that it would thrust a chunk or billet of wood between the outer mouth of the trunk and the door, and creep in and cover the thirsty rice, and closing the door on the inner mouth of the trunk, would remain with its nurselings, to the proclaimed astonishment of the proprietor. This foster mother of rice was as promptly extending its work of beneficence as proprietors became enamored of the dry cultivation of rice, and it soon became apparent that the dry culture system was about to be most mysteriously overthrown by new agencies never dreamed of by the original contracting parties.

In this dilemma the city instituted prosecutions against some of the proprietors under the law already referred to, and which had been overruled by the grammatical decision of a most exemplary judge. I understand that it was proven to the satisfaction of both court and jury that the cultivation of rice was *per se* injurious to health, which it may be supposed was founded upon the remarkable affinity of water for growing rice, as already referred to. The party was convicted, and an appeal was taken to the Supreme Court, which sustained the finding of the court below. Thus, after a long protracted struggle for existence, the dry culture system has vindicated its salutary influence upon the health of the city of Savannah, and its inhabitants are unanimous in its support, and I believe all the proprietors of the dry culture lands now acquiesce in good faith in the measure.

I might earlier have stated that before and after the vote was taken, some of the contractors, sometimes from inability and sometimes, perhaps, from perverseness, did not comply with the conditions of their contracts. The friends of the system doubting the results of any attempt at their legal enforcement, were content to rely on hopes of future amendment, and promptly accepted the abandonment of any dry culture lands, in the belief that their natural growths and the flux and reflux of the tides on them, which followed such abandonment, approximated in influence upon the health of the city to the most ample fulfilment of the contract, and I believe that experience has fully justified this judgment. Such abandonment, by the prompt growth of

a dense cover of bushes, briars, and weeds would measurably, and to that extent, restore the soil to the condition in which it was when Charlestonians sought in Savannah a more healthful climate than their own cherished city then supplied, and when Hugh Bryan sold Hutchinson's Island for a bowl of punch, which was, of course, before the introduction of slave labor into Georgia.

On my settling in Savannah, in the Fall of 1815, I found in full practice there Dr. Samuel Kollock, a gentleman not less remarkable for his social virtues than for his colloquial powers. He told me that he always was advised of the rice harvest by the graver character of the fevers that immediately followed the letting off the harvest water.

I also found in Savannah, W. B. Bullock, then late Senator in Congress, from which he had retired, that he might no longer be deprived of the enjoyments of domestic life. He told me that forty-five was a good old age in Savannah, and that Robert Bolton, who had died at the age of 38, as stated on his tombstone, had been called old Mr. Bolton for some years before his death. Mr. Bullock died at an advanced age, I think above eighty.

When I went to Savannah to live, many respectable families lived on Bay street, which lies next to and parallel to the river. It was the custom of such families to remove into the centre of the city in the Summer, and Broughton street was then preferred. After the introduction of the dry culture system, Bay street, I considered, at least, as healthful as Broughton street.

It was said (and I believe truly) that during the destructive pestilence of 1820, not one case of yellow fever originated south of South Broad street. The great fire of that year had not extended south of Broughton street.

During my practice in Savannah (that is up to 1834), usually in August, sometimes earlier, intermittent fever prevailed in the last and next to the last range of houses south. As the city advanced south, these fevers advanced *pari passu* in the same direction, having abandoned their previous localities.

I believe, my dear sir, I have written all that occurs to me that

may be useful to you. I may have repeated somewhat that I have published, which you will excuse, as I have no means of reference. I am conscious that I may have done little in fulfilment of your wishes; if so, please take the will for the deed.

Very truly, yours,

W. C. DANIELL.

ARTICLE II.

Introduction of Shad into the Southern Rivers emptying into the Gulf of Mexico. By W. C. DANIELL, M. D.

SAVANNAH, May 22d, 1866.

Professor JOSEPH JONES, M. D., Augusta, Ga.—

Dear Sir: I am gratified to say that I have fully established the White Shad in the Alabama River, where they are as large and as fine as our own Shad.

Now that it has become a fixed fact that the Shad prosper at the mouth of the Alabama River, we may readily infer that they will equally prosper at the mouth of the Mississippi River, and probably of all the rivers discharging into the Gulf of Mexico. I hope to test this another year. I would have done so this Spring, but that my fisherman disappointed me. As soon as I was satisfied that there were distinctive, though minute, differences between the Shad of the Savannah and the Ogeechee Rivers, I felt confident of establishing the White Shad in the Alabama River. These differences were pointed out by our fishermen in 1846, and in 1848 I planted the fecundated eggs in a small tributary of the Etowah, and in 1851 or '52 the fish were taken in the traps at the foot of the falls at Wetumpka and Tuscaloosa.

Very truly yours,

W. C. DANIELL.

ARTICLE III.

Petroleum Operations in Alabama. By Rev. J. L. ROGERS.

GADSDEN, ALA, April 25th, 1866.

Dr. JOSEPH JONES, Augusta—

My Dear Sir: Your favor, containing a report on the Coal and Iron Ore that I sent you, came to hand in due time. I ought to have acknowledged it long since, but I have been off here in the back woods, very busily engaged in starting our operations for Petroleum. I think our prospects of success are very good. The indications we have already are very encouraging. Our practical well-borers from Oil Creek seem very confident we will succeed. We have passed through about ten feet shale immediately under the surface soil of four feet, then nineteen feet hard limestone, strongly bituminous, then slate and soapstone, sixty-seven feet, limestone again, three feet, then the first sandstone which we have entered, eight or ten feet. It is strongly bituminous, and the borings smell quite like the oil. At about sixty-five feet we struck what the Pennsylvania men call the "Black Soot" Oil, and which they say is considered in Pennsylvania one of the surest indications of a good well. I have very little doubt that this region will afford oil. Very truly yours,

J. L. ROGERS.

TRANSACTIONS OF SOCIETIES.

ARTICLE I.

Discussion on Cholera. New York Academy of Medicine, Stated Meeting, March 21, 1866; Dr. ALFRED C. POST, Vice-President, in the Chair.

Mr. T. McElroy, by courtesy of the Academy, exhibited the model of a very unique surgical table, and also an invalid bed, after which

Dr. Herzog continued the discussion by referring to an epidemiological map prepared by the War Department of Bavaria, and which he had brought with him for the inspection of the Fellows of the Academy. This had been very carefully prepared

from the most authentic sources, since a commission representing nearly every branch of science had been appointed, with ample powers, to investigate the laws which governed the epidemic there of 1854. Bavaria, he would remark in passing, represents a population of five millions, confined to comparatively a small area, and at the time presented peculiar opportunities for the study of the various causes at work in the progress of this scourge. The artist in the map represents what, for convenience sake, we shall style local epidemics, by red lines, sporadic by green, and mere cholerine by those of a bluish tint. By this device the eye is very readily addressed, and our facts very easily marshalled into line. The commission to which I have alluded embraced, among others equally celebrated, such names as Liebig and Pettenkofer. They performed their duty ably, zealously, and thoroughly. They observed that the epidemic attacked some localities and avoided others, in obedience to other laws than those which govern portable diseases; that certain persons or certain vessels were not responsible for the introduction of this destroying power; or, in brief, that human travel had very little, if anything, to do with the question. They found that the direction of the winds or of the water-courses was a matter of no importance. Why, then, they inquired, as they narrowed down the results of their observations, are these choleraic visitations confined to certain streets, sides of streets, and even certain houses? This led to the search after specific causes, and we have the summary of their conclusions that a dry, solid, rocky, compact soil is uniformly exempt from the infection; while a wet, oozy, soft soil especially invites the invasion. The water underneath the surface of the ground is continually seeking different levels, and in its recession leaves the débris of various offending substances, which ferment and decompose in obedience to well known laws. The only requisite for the spread of the disease in a locality permeated by those underground streams, is the contact of choleraic stools.

The power of the excrements in the causation of the malady was well exemplified in the case of the laundresses employed about cholera hospitals; they were peculiarly susceptible to attack, and the attack almost invariably terminated in death.

Dr. Hutchison, for the sake of giving the discussion a practical turn, wished to hear the experience of his brethren in the matter of treatment. He had acted his part in two epidemics. The one of 1849 he was in the Mississippi Valley, and that of 1854 in this vicinity; and he had come to the conclusion that the preferable plan was to disturb the patient with as few medicines as possible. He had adopted the practice of free vomiting by stimulating emetics, such as common salt and mustard. These agents, he found, controlled the vomiting attendant upon the disease, after the production of their immediate therapeutical effect, much more certainly than creasote, hydrocyanic acid, or any of the salts of opium. They seemed to thoroughly clear the stomach of all offending substances; he remembered a case where the ejection of a piece of lemon-peel, dislodged from this organ by a mustard emetic, gave almost immediate relief. The vomiting of the disease he would set down as rather of a regurgitative character, and as indicative of what nature was striving to accomplish. He also aimed to procure bilious stools by the exhibition of calomel in one-grain doses every hour; in fact, he looked upon nature as an excellent indicator of the plan to be pursued, and had early learned to regard free vomiting and purging as very hopeful signs. For the cramps, he knew of no better plan than the forcible and continuous extension of the muscles—say, for instance, that if the arm were implicated, he would subdue them by putting the extensors upon the stretch. He thought also that some benefit in these cases had been derived by the use of anæsthetics and hot-air baths. He rather favored the method of introducing saline solutions into the circulation, notwithstanding the want of satisfactory results; he had adopted the method in five cases, all of which terminated fatally; none of these, however, were fair tests. Indeed there were many niceties involved in the question of failure; the mode of operating, the quantity, quality, and relation to each other of the materials, the specific gravity and temperature of the solution, etc. The formula he had employed in his earlier cases was as follows: Alcohol ℥ i., chlor. sodium ℥ iii., and water 1 pint. One or two pints were injected into the median basilar vein.

He afterward employed the solution recommended by Dr. Gull,

which was composed as follows: Chlor. sodium 40 parts, chlor. potassium 6 parts, phos. sod. 3 parts, and carb. sod. 40 parts; 140 grains were dissolved in 40 ounces of water, and injected at the temperature of 100°, 115°.

The solutions employed are intended to represent the fluids discharged from the blood, minus the organic materials. He desired to see this method of treatment more thoroughly ventilated.

Dr. Herzog's experience coincided with Dr. Hutchison's; he had known of no recovery where this plan had been adopted. In reply to the question regarding the conclusions of the Bavarian Commission in the matter of disinfecting the evacuations, he would state that chloride of lime was an unreliable agent, and that the most satisfactory results had been derived from the use of the sulphate of copper; an instance or two being quoted where the epidemic was arrested in the residence of the patients immediately after the occurrence of the first case. The sulphates of iron or zinc had also been tried, and were highly extolled.

One part of sulphurous acid and ten parts of water was likewise a good combination. In this the soiled clothing was purified, and by it also the evacuations deprived of their noxious properties.

Dr. Harris had verified in his hospital experience the observation of Pettenkofer, that almost all the first cases were rapid in progress and uniformly fatal; that these conditions prevailed until, to use the language of Dr. Blair, "the complement of mortality had been attained, when the type became milder and more amenable to treatment of any kind." He entertained the opinion that the disease was in some way portable, since, notwithstanding the maintenance of a cordon almost military in character, to prevent the communication of patients in buildings isolated some one hundred or two hundred yards apart, and the exercise of the utmost care in the disposal of the choleraic stools, the epidemic had spread from building to building. Here there was certainly no such thing as personal contact.

Dr. Herzog was reminded also that, according to the statements of the Commission, a local epidemic spent its force in twenty-five days. By the term local he meant certain districts, streets, or neighborhoods; and not, of course, a large aggregation of dwellings like New York City, or even towns of smaller dimensions.

Dr. Hamilton favored, upon the whole, the expectant plan of treatment, and his experience, like that of many present, embraced the observations of two epidemics; these he saw in the City of Buffalo. He had no faith whatever in the beneficial results of morphine or opium in the stage of collapse. He had also exhibited large doses of quinine without any favorable effect; he could recall two cases of recovery after thorough emesis, and would adduce as examples of the success attendant upon the administration of calomel in full doses, the salvation of many patients by a German practitioner not over scientific, but possessed of a good stock of strong common sense.

He would lay much stress upon a change of location as an element of success; he attributed quite a number of recoveries in his experience to the early adoption of this method.

Dr. Stiles recited his experience while assistant physician to the Kings County Hospital. He had there observed that many patients had died almost upon the instant that the limb was tied, as a necessary preliminary to the operation for introducing the saline solution. The medical staff then adopted friction in the direction of the venous circulation, with, as they conceived, happier results. He would warn against the danger of heat, which increased with the rise of the temperature; he had been led to this conclusion by certain experiments upon the lower animals. He would show the futility of the ice-bag plan of treatment, by merely reminding his hearers that there was a continual stream of warm blood coursing in the neighborhood of the spine which required some time to be cooled; and cooling the spine was claimed to be effected by the advocates of the method.

Dr. Foster gave his experience in the epidemic of 1832, at which time he was a practitioner in Scoharie County. He and his colleague had employed with manifest advantage large doses of calomel, larger perhaps than necessary, in conjunction with injections of warm starch, retained through the medium of towels applied to the anal orifice.

He was led to adopt this latter procedure by observing that the rice-water stools were very low in temperature.

The meeting then adjourned.—*Medical Record, N. Y.*

EDITORIAL.

SOUTHERN MEDICAL AND SURGICAL JOURNAL.

Our journal was established thirty years ago, by Dr. Milton Antony, the founder of the Medical College of Georgia. The volumes already issued, embrace over sixteen thousand closely printed pages, containing more than six hundred original communications from professional men throughout the Southern States, besides an immense number of valuable articles republished from its ample list of American and foreign exchanges.

It has been claimed for the SOUTHERN MEDICAL AND SURGICAL JOURNAL, that under the conduct of its able editors it has accomplished a good work in diffusing valuable medical and scientific information, and that it has contributed materially to the advancement and elevation of the medical profession by furnishing a medium for the communication of the valuable experience of Southern physicians.

At the close of a bloody and disastrous civil war, we have re-established this journal, with the earnest desire that it may still live as an honored medium for the communication of the discoveries and advancing doctrines of science, and of all the departments of medicine. We cannot close our eyes to the facts that our armies were vanquished in the field by superior numbers and by starvation, and our records of honor as a people, captured and burned; and that our houses and lands are desolate, our cities burned, and our people distressed and afflicted.

Even in Pagan Rome, the Triumph was accorded only for victories which enlarged the territory, and never for those which only recovered lost ground—no Triumph in civil wars, for in such case, whatever might be the success, the Roman considered it always a subject for public mourning. It would be well for Americans in the distracted state of their country to consider the advice of a noble Roman to the Senate: "All who deliberate upon doubtful matters, ought to be uninfluenced by hatred, affection, anger or pity. When we are animated by these sentiments, it is hard to unravel the truth; and no one has ever been able to serve at once

his passions and his interests. Free your reason of that which beclouds it, and you will be strong; if passion invades your mind and rules it, you will be without strength. It would be here the occasion to recall to mind how many kings and peoples, carried away by rage, have taken fatal resolutions; but I prefer reminding you, how our ancestors, unswayed by prejudice, performed good and just deeds."

Whilst acknowledging no geographical bounds to the operations of science, and especially of medical science, we shall feel it to be our duty as well as our highest pleasure to use the SOUTHERN MEDICAL AND SURGICAL JOURNAL as a medium for the communication of the facts and discoveries tending to develop the material prosperity of the South, and especially for the recording and preserving of the valuable medical statistics and observations of the Confederate Surgeons during the recent revolution. It is earnestly to be hoped, that the medical experience gathered from the gigantic mass of suffering endured during four years by the sick and wounded Confederate soldiers in *Camp* and *Hospital* and in *Prison*, will not pass unrecorded. The medical officers of the Confederate Army, who performed their arduous duties so manfully in the face of unnumbered difficulties, should not consider these labors in behalf of suffering humanity fully accomplished until they have been carefully recorded and placed in a living form.

SPURIOUS VACCINATION.

Our journal opens with an interesting article upon this subject from Dr. Habersham. During the recent civil war, untoward results followed vaccination, and a number of deaths both amongst the troops and citizens were directly referable to the effects of vaccination. So great was the evil in the army, that it was made a special subject of investigation, and a number of most interesting reports were prepared by several of the medical officers, upon what was most generally called in the army "spurious vaccination." Our friend, Surgeon Jackson Chambliss, in charge of Div. No. 1 Camp Winder Hospital, Richmond, had examined and

recorded a large number of cases of "spurious vaccination," illustrated with valuable drawings of the various local diseases and skin affections. As far as our information extends, this valuable mass of matter, relating to one of the most important subjects in its bearings upon the welfare of the human race, was destroyed during the evacuation of Richmond. If any of these reports are still in existence, we shall be happy to be the medium of communicating them to the profession.

So common had accidents become after vaccination, and so strong was the prejudice growing, both in the army and amongst citizens against its employment, that we instituted a series of experiments upon the inoculation of cows with small-pox matter, in order to produce, if possible, cow-pox, from whence a supply of fresh and reliable vaccine matter might be obtained. It was our design to carry out an extensive series of investigations upon the various secondary affections following vaccination, and to determine, if possible, what contagious principles could be associated with the lymph of the vaccine vesicle. These labors were brought to a sudden and unexpected close, by the disastrous termination of the civil war. As far, however, as our labors amongst the Confederate troops extended, we were led to attribute the injurious effects of vaccination to the following causes:

1. *Scorbutic condition of the blood of the patients vaccinated and yielding vaccine matter.*

Large numbers of the Confederate soldiers manifested slight scorbutic symptoms, which were not sufficient to attract attention, or to induce treatment, and as far as we could learn, no attention was paid to this condition either in vaccination or in the selection of vaccine lymph.

In scorbutic patients, all injuries tended to form ulcers of an unhealthy character, and the vaccine vesicles even when they appeared at the proper time, and manifested many of the usual symptoms of vaccine disease, were nevertheless larger and more slow in healing, and the scabs presented an enlarged scaly, dark, unhealthy appearance. In many cases, a large ulcer covered with a thick laminated crust, from one-quarter to one inch in diameter, followed the introduction of the vaccine matter into scorbutic

patients. Matter from these scabs and sores was frequently used in vaccination, and this decomposing pus and blood acted as an animal poison in some cases, and especially in constitutions debilitated by exposure, fatigue, and salt diet.

During the prosecution of the investigations which we instituted upon the diseases of the Federal prisoners confined at Andersonville, the opportunity was embraced of investigating the remarkable effects which followed the attempts of the Confederate medical officers to arrest the spread of small-pox by vaccination. In a number of cases, large gangrenous ulcers appeared at the points where the vaccine lymph had been inserted, causing extensive destruction of the tissues, exposing arteries, nerves, and bones, and necessitating amputation in more than one instance. These accidents led to the belief amongst some of the prisoners that the Surgeons had intentionally introduced poisonous matter into their arms during vaccination.

After careful inquiry we were led to the conclusion that these accidents were in the case of these Federal prisoners referable wholly to the scorbutic condition of their blood, and to the crowded condition of the stockade and hospital. The smallest accidental injuries and abrasions of the surface, as from splinters, or bites of insects, were in a number of instances followed by such extensive gangrene as to necessitate amputation. The gangrene following vaccination appeared to be due essentially to the same causes; and in the condition of the blood of the patients, would most probably have attacked any puncture made by a lancet, without any vaccine matter or any other extraneous material. It appeared also that the dried scab, resulting from the vaccination of these scorbutic patients, was also capable of producing effects wholly different from the vaccine lymph of healthy individuals; and in some cases, these effects were of a most potent and injurious character.

2. *The employment of matter from patients who had been previously vaccinated and who were partially protected.*

Whilst it might admit of debate, whether pure vaccine virus, obtained from persons never before vaccinated, and who manifested all the phenomena of the disease, and especially the characteristic

febrile phenomena, ever becomes deteriorated or possessed of deleterious properties in its passage through numerous human bodies, not suffering with such a contagious disease as syphilis; on the other hand, it cannot be denied that the protective power of vaccination has been impaired to a lamentable and almost incalculable extent, by a succession of imperfect vaccinations.

Vaccination may be rendered imperfect by the development of febrile and other diseased states after the introduction of the virus into the system, arising from the action of cold or some cause producing constitutional disturbances, differing essentially from the febrile phenomena which mark the progress and perfecfection of the vaccine disease, as well as by its imperfect and altered course in those who are partially protected by previous vaccination.

In the isolated condition of the Southern Confederacy, cut off from the surrounding world, and denied even vaccine matter, as "*contraband of war;*" with the necessity of turning out the entire fighting population to repel invasion, and with the necessity of employing all the available medical aid, good, bad, and indifferent; and with the progressive increase of small-pox, it is not strange that the process of vaccination was not as carefully watched and tested as it should have been: and that consequently much imperfect material circulated as *vaccine matter*, which not only afforded little or no protection against small pox, but also proved positively deleterious.

3. *Dried vaccine lymph, or scabs, in which decomposition had been excited by carrying the matter about the person for a length of time, and thus subjecting it to a warm moist atmosphere.*

The effects of such decomposing matter, resemble those of the putrid animal matter received in dissecting wounds. The practice of some physicians to mix a considerable portion of powdered vaccine with water upon a glass slide, and to use this in a number of vaccinations from house to house, is not unattended with danger, especially during warm weather. In the warm climate of the Southern States it is impossible to preserve vaccine matter for any length of time, without more or less putrefaction. The length of time which the vaccine virus will retain its active

properties will depend upon the temperature and the moisture of the climate.

4. *Dried vaccine lymph, or scabs, from patients who had suffered with erysipelas during the progress of the vaccine disease.*

In several instances death resulted from phlegmonous erysipelas, following vaccination in apparently healthy patients, in both civil and military practice. It was supposed that in some cases the poison of erysipelas was conveyed along with the vaccine virus.

5. *Fresh and dried vaccine lymph, or scabs, from patients suffering with secondary or constitutional syphilis, at the time and during the progress of vaccination and the vaccine disease.*

We examined at different times, during the progress of the recent war, and also had under treatment, various skin affections, which presented the characters of the cutaneous diseases characteristic of secondary syphilis, which were directly traceable to impure vaccine virus. In several cases enlarged buboes in the axilla and groin accompanied the peculiar skin affections induced by spurious vaccination.

A number of the Confederate Surgeons took the ground that secondary syphilis could be communicated along with the vaccine virus, and especially when the dried scabs were employed. In the records upon this subject, which we examined in the Surgeon General's Office in the Confederate Capital, this view was clearly announced and supported by well recorded facts. Surgeon O. Kratz, in an interesting article upon vaccination, published in the July number of the *Confederate States Medical & Surgical Journal* (vol. i., 1864; p. 104), boldly announced and supported the view that secondary syphilis could be communicated through the medium of the vaccine virus. On the other hand, many of the Surgeons entertained views similar to those announced by Dr. Habersham in the present number of this journal.

Up to the commencement of the recent civil war, the belief was almost universal, that secondary syphilis could not thus be communicated by vaccination.

This question is of vast importance in its bearing upon the human race, and should not be settled dogmatically—in fact it is not in any manner a question of belief, but of fact. Intimately

associated with this question is that of the possibility of inoculating secondary syphilis.

Some of the older writers appear to have entertained no doubts with reference to the possibility of communicating constitutional syphilis. The following testimony is from William Clowes, who wrote more than two centuries and a half ago:

I have also knowne divers persons infected, who have had in all other parts of the bodie manifest signes thereof, as dolors, tumors, ulcers, and venemous pustules, &c. And yet in the parts aforesaid, no paine, or any signe thereof: so that their opinion is not to be observed, which affirme, that this disease is ingendred onely, by the company of uncleane persons: for I have knowne not many yeares past, three good and honest Midwives infected with this disease, called *Lues Venerea*, by bringing abed three infected women, of three infected children, which infection was chiefly fixed upon the Midwives fingers and hands, &c. What should I speake of young sucking children, whereof divers have beene grievously vexed with this disease, and some of them a moneth, two, three or foure moneths old, and some of them a yeare old, some foure or five yeares old, and some of them sixe or seaven yeares old, amongst which sort, I thought it good here to note a certaine wench, the daughter of one *Sare*, of twelve yeares of age, the which I cured, in the yeare of our Lord 1567, who was greatly infected with this sicknesse in many parts of her body, having thereon painfull nodes or hard swellings and ulcers, with corruption of the bones, and yet no signe in the most suspected parts, neither by reason of debilitie was able to have committed any such act, but it is not to be doubted, but that she received the infection, either from the parents, the which cure of some is supposed uncertaine, whether children begotten by infected parents, may bee cured or not: or else she was infected, as divers are, by sucking the corrupt milke of some infected nurse, of whom I have cured many, for such milke is ingendred of infected bloud, and I may not here in conscience overpasse, to forewarne thee good Reader, of such lewde and filthie nurses: for that in the yeare 1583, it chanced that three young children, all borne in this citie of London, all of one parish, or very neere together, and being of honest parentage, were put to nurse, the one in the countrie, and the other two were nursed in this citie of London: but within lesse than halfe a yeare, they were all three brought home to their parents and friends, grievously infected with this great and odious disease, by their wicked and filthy nurses: Then their parents seeing them thus miserably spoiled and consumed with extreme paines, and great breaking out upon their bodies, and being so young, sick and weake, unpossible to be weaned, were forced, as nature doth binde, to seeke by all meanes possible to preserve these poore silly infants, which else had died most pitifully. To be briefe, ere ever those children could be cured, they had infected five sundry good and honest nurses: I cured one of the children, and the nurse which gave it sucke, the other two children and their nurses were also cured by others, but one of the children lived not long after, as I was given to understand. Also friendly Reader, I read of late in a certain history, written by *Ambrose Pare*, in his 2. book, intreating of the causes of *Lues Venerea*, which history indeed is worthy the rehearsall: "An honest Citizen saith he, granted his most chaste wife, that she should nurse the childe which she was lately delivered of, if she would keepe a nurse to be partaker of the traveil and paines: the nurse that

she tooke by chance, was infected with *Lues Venerea*, therefore she did presently infect the foster childe, and he the mother, and she the husband, and he two children which he had daily at his table and bed, not knowing of that poison which he did nourish in his own body and intrals. But when the mother considered and perceived, that her childe did not prosper or profit by the nourishment, but continually cried and waxed wayward, desired me to tell her the cause of that disease, neither was it any hard matter to doe, for his body was full of the small-pocks, whelkes, and venereous pustules: and the brests of the nurses and mother being looked on, were eroded with virulent ulcers: and the body of the father and his two sonnes, the one about three yeares, and the other foure yeares of age, were infected with the like pustules and swellings that the childe had: therefore I shewed them that they were all infeeted with *Lues Venerea*, whose beginnings, and as it were provocations, were spred abroad by the nurse that was hired, by her maligne infection. I cured them all, and by the helpe of God, brought them to health, except the sucking childe, which died in the cure: and the nurse being called before the magistrates, was punished in prison, and whipped closely, and had been publikely whipped through all the streets of the citie, if it had not been for the honors of that unfortunate family." Thus we see children infected by filthy nurses, and sometimes nurses be infected by giving sucke to such infected children. And now to returne to my former purpose, the disease, as saith *Nicholas Masa*, whose counsell and direction in the cure of this disease I have greatly observed. The disease because it hath a flowing matter, being once entred into any part of the body, proceedeth on from part to part, never resting until it hath corrupted the liver, with the ill disposition of this infection especially. When it toucheth any such part, as hath in it an apt disposition to admit such infection, as when the action or force of the agent is wrought and imprinted in the patient, fitly affected to receive the same forme, and so it disperseth it selfe through the whole bodie: likewise this sicknesse is many times bred in the mouth, by eating and drinking with infected persons, and sometimes and sometimes onely by breathings: and *Almanor* a learned Physition setteth downe for a truth, that this disease may be taken by kissing, and sometimes by lying in the bed with them, or by lying in the sheets after them: also it is said to come by sitting on the same stoole of easement, where some infected person frequenteth, and sometimes such as have been cured of this disease, fall into it againe by wearing their old infected apparell: all which causes of this disease I rather set downe, for that I would thereby admonish as many, as shall read this treatise, to be carefull of themselves in this behalfe, and to shun as much as may be, all such occasions.—*A Profitable and Necessarie Booke of Observations for all those that are burned with the flame of Gun-powder, &c.: By William Clowes, London; M. Dawson,* 1637. *pp.* 151-2-3.

Gideon Harvey, in his "Venus Unmasked," published two hundred years ago, expresses similar views:

4. *Probl.* How many various ways doth the Pox exert its Contagion? No external part is impowered to transmit its infection immediately, except where its suscepted: so we observe the Venereal parts to be infectory immediately upon the susception of virulency, but not through kissing, sucking of the breast, by sweat, or through any other parts but themselves. So the mouth that's infected by kissing, or sucking a thorow pockified whores tet, is capable immediately of infecting anothers lips by kissing, or any other part by sucking it, because the pocky Miasms are

neer; but not by copulation, or sweat, &c. because the contagion cannot be crept so far. Experience verifies this dictate. Is it not an ordinary trick of Wenchers (as *Musa* relates) to suck whores tongues, and tets of their breast, and yet those, whom they know have been pockified many years about their lower parts, and for that reason though their appetites are furious, yet dare not be dabbling, but the other they reiterate a thousand times over without the least hazard? An instance for the other part of the dictate, which I had from my first master in Physick, that wonder of Physicians Prof. *Job. Antonid. vander Linden. p. m.* the profoundest Commentator on *Hippocrates* and *Celsus*, that ever any age presented, whom I heard that most famous *Professor Regius Guido Patin* intitulate the *Dutch Hippocrates.* He during his luculent practice at *Amsterdam*, had a Merchants Prentice in cure of an Gonorrhe, and a blistered, or cankered like mouth; both symptoms he confest to have started upon him at the same time. The excellent Professor being curious, and admiring at the rarity of such distant symptoms emerging at once, extorted an ingenuous confession from his Patient, upon pretence that it would facilitate and abreviate the cure: the other without any longer suspense impudently told him, his tongue was as unfortunate as his tayl; a sort of Diabolick fatyrism, outvying *Aretius flagello de Principi*, and very like a *Dutch* invention. What insued? this bastard at a *Besoeck* (an invitation thats usually made to young folks, preliminary to all Weddings) accosted himself to two pretty Damsels, and being planted between them, oft flanckt to the right, and in a kiss pledged his right hand man, and so to the left, and performed the like duty there. But the tragick evident may imprint a dread upon all young women. A short time after their lips felt hot, inflamed, grew sore, and ulcered, one named it the thrush, another a sore mouth; vulgar applications rather promoted than checkt the evil, wherein they persisted so long, that accessory accidents, as sordid ulcers of the palat and tonsils, nocturnal pains, &c. moved a jelousie of the fowl disease. Here you may remark, how innocently these poor lasses pessundated their fortunes. The reflexion of this relation upon the latter part of the dictate I commit to your own thoughts.

2. A Wench or Monsieur by that time they are thorow pockified, are infectious in any part where ever the Pox bursts out, because the virulent seminaries are propagated quite through the body, which exhaling at the places affected, transport the contagion. What the *thorow-pox* is expect below; so that when the malady is tumefyed to so high a flood, its time for Nurses, Physicians, and all visiters to stand off: upon such occasions a person may be infected by drinking out of the same vessel (provided the spittle adhering be warm still), as we have heard of many; (*Leonardus Botallus* adduceth an observation of a patient of his, of a chast and religious converse, who was stigmatized by a peculiar pledging of his familiar, then under a sore affliction of a *thorow-pox.* His lips inflamed, afterwards ulcered, his jaw bone grew carious, and was miserably rackt with nocturnal arthritick pains.) By trying of a warm Pocky Glove; by succeeding a virulent Patient on a close-stool; by shifting of him, or making his bed whilest the sheets continue warm; as *Nicol. Massa's* friend and Patient, who incurred this evil, by touching the sheets, one lay in, that was lame of a *Neapolitan* ulcer in his legg; and that old woman in *Horst's observ.* aged fifty six, tending a Pocky fellow in his lying in, was seized of the same disease in as furious a degree as her Master: and by kissing, witness *Faventinus*, who knew a young man, that contracted this evil by oft kissing a fowl slut. The initial symptoms appeared about his mouth; his privities, which otherwise might have

bin suspected, appearing free from all contagion. To this I'l parallel another; one Mrs. &c. then a pocky inhabitant of the *Hague*, having run the gantlop of several cures, Hydrotick and Mercurial, at last proved with child; her reckoning being expired, she was brought to bed of a Monster, in all particulars resembling a living child; saving the skin, which was abominally ciphered with spots and botches. This object of *mercy upon us* was committed to the care of a Nurse, the Infant aspiring to higher things, bad the world adieu. But the unhappy Nurse had cause to curse her late Foster-child, her breasts and head ulcered, a *Caries* got into the *cranium*, the Pox took possession of the poor womans carcase, for want of a purse to release her. The pocky original Mistris &c. was proclamed barbarous by a whole Jury of Matrons, for refusing relief to the disastered woman. In all these transactions the *Pater Familias* stood it out vigorously with a fresh countenance, no sign contradicting his pancratick health. Just such another mischance *Musa Brasavolus*, tells us, befell a nurse that suckled one Sr. *Orobo's* child, thorowly conspurcated with the Pox. The observation hereupon infers this a *thorow-pox*, and consequently must prove infectious in all parts of the body. Physicians in this case run a great risk in feeling pulses, and approaching such Patients in their sweats,—*Venus Unmasked, or a More Exact Discovery of the Venereal Evil, or French Disease: By Gideon Harvey, London; T. Grismond*, 1665. *pp.* 94-5 6-7-8-9.

In like manner Daniel Turner in his work on Syphilis, published in 1717, maintains the contagious nature of constitutional Syphilis:

And this I intend shall suffice for its *Chronology* or Time, the *Topology* or Place, and the *Histriograyhy* or Account of the Disease in general; which, with some other Writers thereon, we shall now define, *A venomous or contagious Distemper, for the most part contracted by impure Coition, at least some Contact of the Genitals of both Sexes, or some other lewd and filthy Dalliance between each other that way tending.*

I said *for the most part*, because it is beyond Controversy, the Infection is also communicated by other ways, as from Pocky Parents by Inheritance; by sucking an infected Nurse, to the Child; suckling a diseased Child, to the Nurse; lying also in Bed with the Diseased, without any Carnal Familiarity; by which, though it may be possible for strong and vigorous Bodies to escape, yet are the tender ones, especially of little Infants, very likely to be contaminated, as I have more Reason to believe than by bare Imagination.

There are several other more uncommon Ways of giving as well as receiving the *Venereal* Venom; some of which I have already imparted to the World in short Remarks upon a Quack Libel, Printed several Years past: But the Thought of such vile Monsters, and their execrable Practices, is too shocking (unless to the Dregs of humane Nature) to bear even a Repetition of Circumstances, and fit only for a detestable *Gonologium* or Collection of Smutt and Obscenity, in which I am told, they have been inserted, as some of the Author's own Observations.

As for those fancied Ways of catching it by common Conversation, drinking after one, sitting on the same Close-stool, drawing on a Glove, wiping on the Napkin or Towel, after the infected Person, with a hundred the like Stories; I believe in our time (whatever may have happened formerly) there is no great Danger: Yet we find in one of our late Chronicles, that these and such like Imaginations, were so strongly rivetted in Mens Minds at that time, even those of the better and more

learned sort, that it was one of the Articles against a noted Cardinal, That he had breathed on the King, when he, the said Cardinal, had this Disease upon him: Which you will find in *Baker's* Chronicle, and of which Passage Dr. *Harvy* has also taken Notice. *Hildanus* likewise tells us of a young Gentlewoman, who contracted the same, by only putting on the Apparel of a Gentleman (that it seems was pox'd) at a Masquerade, of which, through Modesty concealing her Illness (which first of all had seized the *Pudenda*) till she was past Recovery, she deceased. The good Man's Credulity, at least his Charity, might however be abus'd in this Relation, as the young Lady perhaps was also after the Masque, otherwise than by simply putting on the Habit. But were it so as the Case is stated, there is nothing therein much more admirable than what the same great Man recites of a whole Family he knew infected, viz. the Wife with three Children and a fourth in the Womb, as also a Maid Servant, by the Husband, who had got the Distemper in their Absence only by sleeping in the same bed with his Man Servant, whom he after understood was broke out with this Distemper.

The Relation of *Horst.* and *Hornung.* are yet more strange, of several People infected in the Bagnio, by having the same Scarificator apply'd after Cupping, as had been used to a *Venereal* Patient: Which seems a like credible with that of the Priest poxed at his Ear, in the time of confessing a wanton Nun; the venomous Breath from her Mouth defiling the holy Father: But enough of this.—*Syphilis; A Practical Dissertation on the Venereal Disease: By Daniel Turner, London; R. Bonwicke & Co.*, 1717. *pp.* 10-11-12.

John Hunter, in his Treatise on the Venereal Disease, gives a number of instances of the communication of secondary syphilis, from which we select the following:

A lady was delivered of a child on the 30th of September, 1776. The infant being weakly, and the quantity of milk in the mother's breasts abundant, it was judged proper to procure the child of a person in the neighborhood to assist in keeping the breasts in a proper state. It is worthy of remark that the lady kept her own child to the right breast, the stranger to the left. In about six weeks the nipple of the left breast began to inflame, and the glands of the axilla to swell. A few days after, several small ulcers were formed about the nipple, which, spreading rapidly, soon communicated and became one ulcer, and at last the whole nipple was destroyed. The tumour in the axilla subsided, and the ulcer in the breast healed in about three months from its first appearance. On inquiry, about this time, the child of the stranger was found to be short-breathed, had the thrush, and died tabid, with many sores on different parts of the body. The patient now complained of shooting pains in different parts of the body, which were succeeded by an eruption on the arms, legs, and thigh, many of which became ulcers.

She was now put under a mercurial course, with a decoction of sarsaparilla. Mercury was tried in a variety of forms: in solution, in pills internally, and externally in the form of ointment. It could not be continued above a few days at a time, as it always brought on fever or purging, with extreme pain in the bowels. In this state she remained till March 16th, 1779, when she was delivered of another child in a diseased state. The child was committed to the care of a wet nurse, and lived about nine weeks; the cuticle peeling off in various parts, and a scabby eruption covering the whole body. The child died.

Soon after the death of the child, the nurse complained of headache

ınd sore throat, together with ulceration of the breasts. Various remelies were given to her, but she determined to go into a public hospital, vhere she was salivated, and after some months she was discharged, but ıot cured of the disease. The bones of the nose and palate exfcliated, ınd in a few months she also died tabid.

Of the various remedies tried by the lady herself, none succeeded so vell as sea-bathing. About the end of May she began a course of the Lisbon diet-drink, and continued it with regularity about a month, dressng the sores with laudanum, by which treatment the sores healed up; ınd in September she was delivered of another child, free from external narks of disease, but very sickly; and it died in the course of the month.

About a twelve month after, the sores broke out again, and, although nercurial dressings and internal medicines were given, remained for a twelve month, when they began again to heal up. * * * *

The third case was of a gentleman, where the transplanted tooth remained, without giving the least disturbance, for about a month, when the edge of the gum began to ulcerate, and the ulceration went on until the tooth dropped out. Some time after, spots appeared almost everywhere on the skin; they had not the truly venereal appearance, but were redder or more transparent, and more circumscribed. He had also a tendency to a hectic fever, such as restlessness, want of sleep, loss of appetite, and headache. After trying several things, and not finding relief, he was put under a course of mercury, and all disease disappeared according to the common course of the cure of the venereal disease, and we thought him well; but some time after the same appearances returned, with the addition of swelling in the bones of the metacarpus. He was now put under another course of mercury, more severe than the former, and in the usual time, all the symptoms again disappeared. Several months after the same eruptions came out again, but not in so great a degree as before, and without any other attendant symptoms. He a third time took mercury, but it was only ten grains of corrosive sublimate in the whole, and he got quite well. The time between his first taking mercury and his being cured was a space of three years.—*The Works of John Hunter, with Notes, edited by James F. Palmer. Vol. ii., p.* 475-476; *p.* 484.

We might greatly multiply such facts from various authors, but this appears to be unnecessary, as the experience of the authors just quoted covers nearly three centuries; and we are justified in affirming that it is now clearly established that constitutional syphilis can be transmitted by direct inoculation with the secretions of secondary sores.

And more recent experiments have shown that the blood of persons affected with constitutional syphilis is capable when inoculated on healthy subjects of giving rise to syphilitic disease.

Waller succeeded in inoculating a healthy boy fifteen years old, with this disease, by applying the blood of an individual affected with secondary syphilis to incisions made by a scarificator on the body of the boy. Well marked and unmistakable symptoms of econdary syphilis followed this experiment. Other experimenters

have arrived at similar results, but the best conducted experiments appear to be those performed by Professor Pelizzari,* of Italy.

As this subject is of great interest, and as we have been cut off from the main sources of information upon this and other medical questions, we present the account of these experiments, as well as of the most recent and circumstantial facts illustrating the transmission of secondary syphilis through the vaccine virus, as it is contained in one of the most recent works on Venereal Diseases:

This physician inoculated two medical students with the blood of a syphilitic patient with a negative result. On the 6th of February, 1862, he resumed his experiments, three physicians, Drs. Bargioni, Rosi, and Passagli submitting themselves to his investigations. The blood of a female patient, aged twenty-five, affected with constitutional syphilis, and who had undergone no treatment, was used for the purpose. The blood was drawn, with a new lancet, from the cephalic vein. The patient was at the time affected with mucous papules on the left labium, at the place where the chancre had existed; mucous tubercles surrounded the anus, and the inguinal glands were indurated and enlarged. A confluent syphilitic eruption existed upon the body, the posterior cervical glands were enlarged, and there were pustules on the head. At the point on the arm from which the blood was drawn there was no sign of any eruption, the skin of the part was well washed, and the surgeon washed his own hands. The bandage was new, as was also the vessel in which the blood was received. As the blood escaped from the cephalic vein, some of it was received on a piece of lint, which was placed on the upper part of Dr. Bargioni's arm, where the epidermis had previously been removed, and three transverse incisions made. A similar operation was performed on the other two gentlemen, but in the case of one the blood was cold, and in that of the other it had coagulated.

After twenty-four hours the dressings were removed, and nothing was observed but the crusts formed by the effused blood. Four days afterward all traces of the inoculations had disappeared.

On the morning of the third of March, Dr. Bargioni informed Prof. Pelizzari that in the center of the inoculated surface he had noticed a slight elevation, which produced a little itching. The arm was examined, and at the point indicated Prof. Pelizzari found a small papule of a roundish form, and of a dull-red color. On the eighth day the papule had augmented to the size of a twenty-centime piece. On the eleventh day it was covered with a very thin adherent scale, which became denser, and on the second day commenced to crack in its central part. On the fourteenth day two axillary glands became enlarged to the size of nuts. The papule remained indolent, and there was no induration at its base. On the twenty-first the scale was transferred into a true crust, and the part beneath was ulcerating. Slight induration was more evident. On the twenty-second the crust was detached, leaving a funnel-shaped ulcer, with elastic and resistant borders, forming an annular induration. There was but a small amount of secretion from the sore, and the pain was trifling. On the twenty-sixth the ulcer had become as large as a fifty-centime piece, and the surrounding induration was considerably increased. Up to the 4th of April the ulcer remained stationary, but at that date

*Lectures on Syphilis, etc., by Henry Lee, 1863; p. 198.

its base appeared to be granulating. The axillary glands remained swollen, hard, and indolent. Slight nocturnal pains occurred in the head about this time, and the posterior cervical glands became somewhat enlarged. On the 12th of April spots of an irregular form and of rose color appeared on the surface of the body. The eruption extended itself, and during the succeeding days became more confluent. No constitutional disturbance, heat of skin, or pruritus accompanied it. On the twentieth the cervical glands had increased in size and were harder. The chancre maintained its specific character and exhibited no tendency to cicatrization. On the twenty-second the color of the eruption was decidedly coppery. Small lenticular papules were now perceived to be mixed with the erythema. The edges of the chancre had begun to granulate. Mercury was now administered.

This case is of itself sufficient to prove the inoculability of syphilis through the blood of an infected person. But the evidence does not stop here.

In a very interesting memoir, M. Viennois* has collected many cases of the transmission of syphilis by vaccination, and has summed up his conclusions from the data on hand. From his observations and researches it would appear that syphilis cannot be communicated by vaccine virus taken from a subject affected with the disease unless a portion of the blood of the individual is also inoculated. Thus he says:—

'When the vaccine virus of a syphilitic subject, pure and unmixed with blood, is inoculated on a healthy individual, a simple vaccine pustule is obtained, without any near or remote syphilitic complications being produced.

'On the contrary, if, with the vaccine virus of a syphilitic individual who either has or has not at the time constitutional accidents, a healthy person is vaccinated, and the point of the lancet be charged with a little blood at the same time as with the vaccine virus, both diseases may be transmitted by the one operation—the vaccine disease with the vaccine virus, and syphilis with the syphilitic disease.'

M. Viennois also concludes that in such cases the vaccine vesicle is developed first, and that after undergoing its incubatory period the syphilitic ulcer, with all the characteristics of a true chancre, appears.

These views of M. Viennois have recently received the most ample confirmation from the tragedy which occurred at Rivalta, in Italy, by which forty-six children and twenty nurses had syphilis communicated to them through vaccination, and of which several of the children died. The full details of this remarkable event are given in a memoir by Dr. Pacchiotti,† of Turin, and I condense the following summary from his report.

On the 21st of May, 1861, Sig. Cagiola vaccinated Giovanni Chiabrera with lymph contained in a tube sent from Acqui. The operation was performed in the usual manner and with a perfectly clean lancet. The child was eleven months old, and in good health at the time. Forty-six other children were, ten days subsequently, vaccinated with lymph taken from the vesicle of this child; and ten days after this, seventeen children were vaccinated with lymph taken from the arm of Luigia Manzone, one of the forty-six first vaccinated.

Of these sixty-three children, forty-six—thirty-nine of the first lot and seven of the last—were within two months attacked with syphilis. On

*De la Transmission de la Syphilis par la Vaccination. Archiv. Gen. de Med., Juin, Juillet, et Septembre, 1860.

†Sifilide trasmissa per Mezzo della Vaccinazione in Rivalta, presso Acqui. Gazzetta della Associazone Med., Ottobre 20, 1861.

the 7th of October seven of them, including the little Manzone, were dead, three were yet in danger of dying, fourteen were recovering under the use of mercury and iodine, and one was well.

A medical commission was now appointed to inquire into all the circumstances connected with this fatal event, and they proceeded to the execution of the duty assigned them.

Twenty-three children were examined in full; the others were not so accurately noticed, as their parents had neglected to avail themselves of medical aid in time. In the forty-six children who were affected, syphilis appeared at periods varying from ten days to two months after vaccination, the average time being twenty days. The initiatory symptoms were variable. Sometimes just as the vaccine vesicle had healed, it became surrounded with a red, livid, and copper-colored areola, and ulcerated again. In other instances an ulcer would form on the cicatrix, and become covered with a scab, which in a few days would fall off to make room for another, and so on. In others the vaccine vesicles had an unhealthy appearance from the first, and were accompanied by a general eruption.

The principal symptoms observed by the commission were mucous tubercles in the vicinity of the anus and on the genitals, ulcerations of the mucous membrane of the lips and fauces, engorgement of the lymphatic glands in the groin and neck, syphilitic skin diseases, alopecia, deep tubercles, gummy tumors, etc.

In two subsequent papers, Dr. Pacchiotti* continues the detail of his investigations. On the 8th of February, twenty of the mothers or nurses of the forty-six children had become affected with symptoms of syphilis. He ascertained, too, from a revaccination of five of the children, that the occurrence of syphilis had not destroyed the efficacy of the first vaccination. But he also discovered the source of the infection. It appeared that a year and a half previously a young unmarried woman had had syphilis, and that she was syphilitic at the time Chiabrera was vaccinated. This woman was the mother of a child which had died syphilitic three months after its birth. After the death of the child she was in the habit of having her breasts drawn by the little Chiabrera, and gave him the clothes which her own child had worn. Another child nursed by this woman, but who was not vaccinated, also became syphilitic, and this child infected its mother just as little Chiabrera did his mother. It is therefore shown that the vaccine virus used on Chiabrera was not at fault, but that all the other forty-five children were infected through the lymph taken from his arm. It is also shown that blood was on the lancet when several of the children were vaccinated.

Dr. Pacchiotti, as the results of his investigations and those of the commission, gives the following rules to be observed in vaccinating:—

1st. Examine the child from whom the lymph is taken.

2d. Inquire into the state of the parents' health.

3d. Take the lymph in preference from those children who have passed the fourth or fifth month, as hereditary syphilis appears in general before that time.

4th. Do not use lymph taken from a vesicle which has passed its eighth day, because on the ninth and tenth days the lymph becomes mixed with pus, which latter may be of an infectious character.

5th. In taking the lymph, avoid hemorrhage, as there is less danger with lymph free from blood.

6th. Do not vaccinate too many children with the same lymph.

*L'Union Medicale, Fev. 8eme et Avril 3eme, 1862.

In consequence of the publication of the details of the lamentable affair at Rivalta, Dr. Marone concluded to relate the particulars of a similar event which occurred to him, and in regard to which he had thought it advisable to maintain a discreet silence. The particulars are given with sufficient fullness by Mr. Lee, whose excellent work I have already referred to several times.

It seems that in November, 1856, Dr. Marone obtained some vaccine lymph, with which he vaccinated a number of children at Lupara. The lymph was contained in glass tubes, and Dr. Marone noticed that it was mixed with a little blood, which affected its transparency. Of the number of children vaccinated with this lymph, notes were preserved in twenty three cases. All these were affected with syphilis, and the disease likewise manifested itself among the mothers, nurses, and even the servants who were brought in contact with them. The symptoms with which the children were affected consisted chiefly of eruptions of a syphilitic character, and subsequently of mucous tubercles at the angles of lips, around the anus, and on the vulva. The post-cervical and inguinal glands were enlarged, and there was emaciation, in degree varying with the severity of the syphilitic symptoms.

Besides these cases, eleven nurses of the number who suckled these children gave the disease to eleven other children who were not vaccinated.

In some of the cases the syphilitic phenomena continued till April, 1859.

Dr. Marone draws the following conclusions from his experience:—

"That the syphilitic virus was really transmitted in the above recorded cases by means of vaccination.

"That the children vaccinated suffered first, and became the means of transmitting the disease to others.

"That the lymph used for the purpose of vaccination was impure, being mixed with blood, and that the result shows how necessary it is to abstain from using lymph of that description."—*Lectures on Venereal Diseases: By Wm. A. Hammond, M. D. Philadelphia: J. B. Lippincott & Co.*, 1864. *p.* 208-217.

The experience of the Confederate Surgeons, establishing the possibility of communicating constitutional syphilis by vaccination; the experiments of Waller, Pelizzari and others, establishing the possibility of communicating secondary syphilis by inoculation of the blood from patients suffering with the constitutional symptoms of this disease into healthy individuals: the cases collected by M. Viennois illustrating the transmission of syphilis by vaccination: and the unfortunate tragedy of Rivalta in the district of Piedmont Italy, (where syphilis was previously unknown) (forty-six children of various ages being simultaneously attacked with well-marked syphilis, proceeding in all cases which could be properly examined from the action of vaccine virus which produced chancre on the arms, followed by buboes in the axilla, and all these children had been vaccinated directly or indirectly

from a single child, who was subsequently proved to have contracted syphilis from a wet nurse, and these children transmitted the disease to a number of women, their wet nurses and mothers, and even to children who played and nursed with them, and the women so infected, in turn infected their husbands, and finally the disease yielded in all cases to the usual remedies for syphilis): these, and other similar facts, as the infection of the infant at the breast with secondary syphilis, and the communication of syphilis from the infant inheriting the disease from its mother or father, to a healthy nurse,—all demonstrate the possibility of transmitting constitutional syphilis by inoculation of syphilitic blood, or vaccine virus, from patients poisoned with syphilis: and each such fact, of itself is sufficient to overthrow the dogma, that "Primary syphilis alone is capable of being inoculated, and that secondary affections and the constitutional disease cannot be communicated from one individual to another, by any means as vaccination, or the direct inoculation of syphilitic blood."

Vaccine Matter from the Cow.

M. Lanoix has read a paper on this subject before the Academy of Medicine at Paris. This physician, after studying the subject at Naples, is founding in the capital of France an establishment for such vaccination. In the paper it is stated that out of 820 revaccinations practiced in different schools upon children from seven to thirteen years old, 21 per cent. succeeded. The figures respecting a more advanced age are as follows: From fourteen to twenty years, 71 revaccinations, 31 effectual; from thirty to forty years, 200 revaccinations, 97 effectual; from forty to fifty-five years, 30 revaccinations, 7 effectual; from fifty to sixty years, 5 revaccinations, 2 effectual. The author considers that the transmission of vaccine matter from heifer to heifer is always possible, the quantity obtained being quite adequate to very numerous operations; that the matter does not lose in activity in passing through animals as it does in passing through human organisms; that vaccinations are always or almost always successful; the revaccination with animal matter succeed more frequently than with matter obtained from human beings; that vaccination with heifer matter is extremely easy; and that such vaccinations are highly useful in epidemics of small-pox, as larger supplies of vaccine matter may rapidly be sent to extensive tracts of country.—*London Lancet.*

MEDICAL COLLEGE OF GEORGIA, AUGUSTA.

The exercises of this good old institution having been suspended during the late war, were resumed on the first Monday in November last. The class in attendance, in consequence of the disastrous effects of our conflict, was very small when compared with the full benches of former years. It numbered, however, forty-seven young men of fine promise, of which thirty-seven were from Georgia, four from South Carolina, one from Alabama, one from Louisiana, one from Kentucky, and three from the United States army.

The following named gentlemen having complied with all the rules of the College, were graduated Doctors of Medicine:

Fontenoy A. Beall, of Augusta, Ga.

William W. Bussey, of Columbia County, Ga.

Louis A. Cormick, of Augusta, Ga.

John W. Johnston, of Scriven County, Ga.

David S. McIver, of Newnan, Ga.

Benjamin B. Palmer, of Richmond County, Ga.

Robert G. Solomon, of Gordon, Ga.

Beverly H. Washington, of Louisville, Ky.

Amos G. Whitehead, of Burke County, Ga.

Dr. Frank J. Moses, a graduate of the Medical College of South Carolina, and Dr. Virginius G. Hitt, a graduate of the Medical College of Richmond, Va., were admitted *ad eundem gradum.*

This is one of the oldest Medical Colleges in the South, and its Faculty, Library, Museum, and Laboratory, will compare favorably with any in our country. We may therefore reasonably expect for it a career in the future as prosperous as it has been in the past, when its classes numbered from one hundred and fifty to one hundred and seventy-five. The deplorable condition of Southern finances may render recuperation slow, but the merits of this institution must secure to it a return of its former prosperity if our people are true to themselves.

The next session will be commenced on the first Monday in November next, when we have every reason to believe that the class will be materially increased.

Process of Disinfection.

A memorandum on disinfection has been issued by the Privy Council (Great Britain). In view of the approaching epidemics, we give its main points, after the *Chemical News and Druggists' Circular:*

'1. For artificial disinfection, the agents most useful are—chloride of lime, quicklime, and Condy's manganic compounds. Metallic salts—perchloride of iron, sulphate of iron, and chloride of zinc are applicable. In certain cases chlorine gas or sulphurous acid gas may be used; and in other cases powdered charcoal or fresh earth.

'2. If perchloride of iron or chloride of zinc be used, the common concentrated solution may be diluted with eight or ten times its bulk of water. Sulphate of iron or chloride of iron may be used in the proportion of a pound to a gallon of water, taking care that the water completely dissolves the sulphate of iron, or has the chloride of lime thoroughly mixed with it. Condy's stronger fluid (red) may be diluted with fifty times its bulk of water; his weaker fluid (green) with thirty times its bulk of water. When the matters requiring to be disinfected have an offensive smell, the disinfectant should be used till this smell has entirely ceased.

'3. In the ordinary emptying of privies or cesspools, use may be made of perchloride of iron or chloride of zinc, or of sulphate of iron. But where disease is present, it is best to use chloride of lime or Condy's fluid. Where it is desirable to disinfect, before throwing away the evacuations from the bowels of persons suffering from certain diseases, the disinfectant should be put into the night-stool or bed-pan when about to be used by the patient.

'4. Heaps of manure or of other filth, if it be impossible or inexpedient to remove them, should be covered to the depth of two or three inches with a layer of freshly burnt vegetable charcoal in powder. Freshly burnt lime may be used in the same way, but is less effective than charcoal. If neither charcoal nor lime be at hand, the filth should be covered with a layer of some inches thick of clean dry earth.

'5. Earth near dwellings, if it has become offensive or foul by the soakage of decaying animal or vegetable matter, should be treated on the same plan.

'6. Drains and ditches are best treated with chloride of lime, or Condy's fluid, or with perchloride of iron. A pound of good chloride of lime will generally well suffice to disinfect 1000 gallons of running sewerage; but of course, the quantity of disinfectant required will depend upon the amount of filth in the fluid to be disinfected.

'7. Linen and washing apparel requiring to be disinfected should without delay be set to soak in water containing per gallon about an ounce either of chloride of lime or Condy's red fluid. The latter, as not being corrosive, is preferable. Or the articles in question may be plunged at once into boiling water, and afterward, when at wash, be actually boiled in the washing water.

'8. Woollens, bedding, or clothing which cannot be washed, may be disinfected by exposure for two or more hours in chambers constructed for the purpose to a temperature of 210 to 250 degrees Fahrenheit.

'9. For the disinfection of interiors of houses, the ceilings and walls should be washed off with quicklime water. The wood work should be well cleansed with soap and water, and subsequently washed with a solution of chloride of lime, about two ounces to the gallon.

'10. A room, no longer occupied, may be disinfected by sulphurous acid gas or chlorine gas—the first by burning in the room an ounce or two of flowers of sulphur in a pipkin; the second by setting in the room a dish containing a quarter of a pound of finely-powdered black oxide of manganese, over which is poured half a pint of muriatic acid, previously mixed with a quarter of a pint of water. In either case, the doors, chimney, and windows of the room must be kept carefully closed during the process, which lasts for several hours.'—*Journal of Materia Medica; Boston Medical and Surgical Journal.*

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Practical Observations on the Generation of Statical Electricity, by the Electrical Machine. By Col. George W. Rains.

Essay on Osmosis. (Extracted from the American Journal of the Medical Sciences, for July, 1865.)

Report of the Surgeon-General of Massachusetts, Dec. 1st, 1865. Boston; Wright & Potter: 1866.

Successful Removal of the Uterus and both Ovaries, by Abdominal Section, etc. By Horatio R. Storer, M.D. Boston; David Clapp & Son: 1866.

Instructions in the Preparation, Administration, and Properties of Nitrons Oxide. Ry George T. Barker, D. D. S., etc. Philadelphia; Rubencame & Sockton: 1866.

Priced Catalogue of Standard Books. By Smith, English & Co., No. 23 North Sixth street, Philadelphia: 1866.

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An Essay on Agriculture. By J. H. Cocke, Sr., Bremo Bluff, Fluvanna County, Va.

Revue De Thèrapeutique Medico-Chirurgicale. Par A. Martin Lauzer. Paris: April, May.

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Propriety and Necessity of Compulsory Vaccination. By J. M. Toner, M. D., Washington, D. C. Philadelphia; Collins, Printer: 1865.

A Catalogue of Medical Works on Cholera, in the Library of J. M. Toner, M. D., Washington, D. C.: 1865.

The Medical and Surgical Reporter: A weekly journal, S. W. Butler, M. D., Editor; 115 South Seventh street, Philadelphia: vol. xiv.

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The Chicago Medical Examiner: Edited by N. S. Davis, M.D., Chicago: March, April, May, June.

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Atlanta Medical and Surgical Journal: Edited by Drs. J. G. & W. F. Westmoreland. Atlanta, Ga.: May.

The Savannah Journal of Medicine: Edited by Drs. J. Harris, J. B. Read and J. G. Thomas. Savannah, Ga.: February, March.

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SOUTHERN

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ORIGINAL COMMUNICATIONS.

ARTICLE VI.

Report on Wounds of Large Joints made to the "Confederate States Association of Navy and Army Surgeons," Richmond, Va., 1864. By J. B. Read, M. D., formerly Surgeon in the Provisional Army of the Confederate States.

[Concluded from p. 29, No. 1, July, 1866.]

Incised wounds of the joint made by trenchant instruments, as the knife, sabre or scythe, often heal kindly, and are not so invariably followed by traumatic arthritis as in the case of gunshot wounds. Such incised wounds are often made by the Surgeon for the extraction of cartilaginous growths, lying free in the synovial sack. It is worthy of notice, that in these cases the joint and the foreign body are manipulated so as to make the incision into the sack, valvular, to prevent entirely the entrance of air.

In a war conducted as this has been, in a wooded, hilly country, unfavorable to the action of cavalry in their

proper arm, incised wounds of joints have rarely been under the treatment of Surgeons in our service. We find no statements of any such cases in the records of the Surgeon-General's Office, and we presume there are none.

Macleod mentions the case of a dragoon, who was cut across the elbow, of his sword arm, by a Russian horseman, at the heavy cavalry charge at Balaklava. The olecranon was completely detached, and the joint opened. The wound was immediately closed, and the arm placed in an extended position, and cold employed to allay inflammation; little more was done, and the divided surfaces quickly adhered, and an arm remained, which, although not as free in its motions at that joint as it formerly was, yet most useful, and would, I doubt not, become more so in time. Other cases are mentioned by authors on military surgery, in which the joint had been opened by incised wounds, and those produced by sharp-pointed stylet-shaped weapons, rapidly uniting, when at once closed and the air perfectly excluded.

Shell wounds of joints in many cases, are of the nature of incised wounds, but can hardly be treated as such. In some cases, when the bones and articular cartilage are not injured, and the wound in capsule is large enough to permit of the free outflow of the fluids secreted, they do well and heal with ankylosis.

But one instance of incised, or rather it was a penetrating wound, produced by a sharp spike of glass, has come under our observation during this war. A medical officer being at dinner in a room on the ground floor had occasion to leave the room. He stepped out of the window on an iron grating, which gave way and precipitated him into an area some eight or ten feet deep, on some rubbish and broken bottles. He fell upon his knee; beyond the general discomfort that would ordinarily be produced by such an unexpected descent, he experienced neither

pain nor annoyance. In a short time he walked up to the Capitol Square, to see the evening parade and listen to the music of the band; and at that time, whilst resting on one of the benches, he first felt pain in the knee. This was not acute enough to direct his attention especially to its condition. After parade he walked to his room, say one-half mile off; his knee now became very painful, and medical aid was solicited. Two hours after the fall, he was found in his bed in a state of great alarm, and stated that he had a piece of glass in his knee-joint. On examining his knee, a small opening of about a quarter of an inch was found just below the under edge of the patella in the line of the joint on the outer side; no synovia had escaped from the wound, nor could any connection with the interior of the capsule be detected. Passing the finger carefully over the articulation, a small, unnatural, projecting point was detected, more than an inch below the wound, in the skin. The skin was carefully drawn down, so as to make the wound correspond to the projecting substances, and with a fine pair of forceps, a wedge-shaped piece of crown glass, an inch long, was extracted; a few drops of synovial fluid, streaked with blood, followed this. The skin was at once allowed to return to its normal position, and the lips of the cut were nicely adapted and hermetically sealed by adhesive plaster. The leg was fixed so as to prevent all motion of the joint, and he was removed to General Hospital No. 4, for treatment. The articulation was kept cool with a solution of muriate of ammonia in whiskey and water; morphia was administered to procure sleep, and absolute rest directed. No inflammatory action ensued; there was little fever, and no pain worth mentioning; there was some tenderness upon pressing over the joint. The wound healed readily, united without suppuration, and in six days the patient was able to bend his knee and exercise.

In wounds of this character we are then encouraged to hope for the best results, and that there will be no loss of the motion of the articulation.

The treatment consists in the speedy and perfect adaptation of the edges of the wound through its depth, as far as possible, by compresses on each side of it. The wound should be perfectly closed, to the total exclusion of the air, by collodion; or if this be not at hand, by adhesive plaster, varnished over as advised by Mr. Abernethy, with a solution of sealing wax in spirits of wine, which hardens in a few minutes. The solution of gutta percha in chloroform would answer a better purpose, as it will not crack and fissure. The joint must be carefully adjusted in some immovable apparatus, so that the edges of the wound may be kept perfectly adapted, and such means must be employed as to restrain the hypersecretion of the synovial fluid, which will certainly come on with the increased action in the vessels of the wounded part.

Bleeding, general and local, and the constant application of cold to the part, must be resorted to, for we must bear in mind that if this inflammatory action be not restrained, the life of the patient may, or rather will, be placed at hazard.

If, despite all our efforts to the contrary, the joint becomes painful and swollen; if rigors and high constitutional excitement supervene, we suggest that the joint should be freely incised, and then treated as other wounds of joints in which traumatic arthritis exists.

John Bell says we may take the united experience of all Surgeons, which has established this as the true prognostic, that "wounds of joints are mortal." The diction of so great a man and distinguished Surgeon, although not really correct, will show how serious such injuries are; how grave the "prognostic," and how much anxiety

they should excite. We, at this late day, after the experience of the recent and present wars, are probably better instructed as to the treatment of such injuries; and as a rule, there are probably no wounds in the body occasioned by the accidents of war, in which so much is to be expected from the skill of the Surgeon, and from the exertions of which such favorable results follow; or on the other hand, if he have not such skill, or having it, neglect to employ it, for the benefit of the patient, no class of wounds are more mortal.

Wounds of the orbicular are not of so serious a character as those of the hinge-joints. Their less complexity of structure accounts for this. The results of joint wounds in the upper and inferior extremities differ, owing to the less size of the articular facets of joints of the same character, and to the same law of nearness to the centre of circulation which governs the result of wounds and injuries and of amputations in the two extremities. The larger joints of the superior extremity may get well, as far as the closing of the wound is concerned, but with ankylosis and deformity. It is rare for the two larger joints of the inferior extremity to recover without aid from the Surgeon. No cases of recovery from wounds implicating the hip-joint are noted in our records, save where the resection of the head of the femur has been employed. The experience of Surgeons of the Allied army before Sebastopol was unanimous that all cases where the knee-joint was distinctly known to be injured were fatal, when amputation was not resorted to. Macleod states that in 1854 he saw forty cases in the French Hospital, and all died except those primarily amputated. In the Indian reports, the same gentleman found nine cases in which the knee was penetrated, and the injury so slight as to induce attempts to save the limb, and yet all died. Alcock has stated the proportion of

cases in which the articulation was wounded, to other gun-shot wounds, as between four and five per cent., nearly one-half of which were in the knee. Out of thirty-five cases in which the knee was more or less implicated, twenty-two lost their lives, and eight their legs. After such results, he says it is little to say, that the five who recovered preserved good and useful legs.

We have forestalled, the discussion of injuries to the joint, in order to explain the extraordinary record we have before us, compiled from the data in the office of the Surgeon-General. These records give, in regard to this special joint, statistics far different from any ever before published.

	Should'r	Elbow	Wrist	Hip	Knee	Ankle
No. of Cases	17	52	25	9	99	29
Recovery	11	47	23	..	45	27
Ankylosis	5	32	25	..	40	10
Motion	..	2	..	..	..	..
Deaths	6	5	2	8	54	8
No result	6	13	12	..	14	11
Cases still under treatment*	8	7	2	1	24	9

*Of which the result can only be surmised. Those of the knee and hip are reported as doing badly.

INCISIONS INTO THE CAVITIES OF JOINTS.

	Should'r	Elbow	Wrist	Hip	Knee	Ankle
No. of Cases	2	11	10	..	25	5
Primary	..	..	..	..	2	..
Secondary	2	3	3	..	17	3
Time not stated	..	8	7	..	6	2
Deaths	..	1	..	..	14	1
Recovery	2	5	8	..	2	3
Under treatment	..	5	3	..	9	1

The appearance of the external wounds give no indication in many cases of the actual damage sustained by the articulation. In some cases that have come under our observation the position of the orifice of entrance and exit of the bullet, and the absence of pain in the joint, and the patients stating that they had used the limb after the injury, and in cases of knee-joint wounds, having walked some distance, we did not suspect any serious injury to the articulation; yet subsequently traumatic

arthritis, with profuse suppuration having been established, the joints have been opened, and great destruction of the ends of the bones entering into the formation was found to exist.

It is a fact well established by the experience of most Surgeons conversant with military surgery, and fully borne out by the records we have consulted, that at a variable period after the reception of the wound, the joint becomes inflamed, and profuse suppuration comes on, and that at this time severe and dangerous symptoms set in. We find only the records of a single case in which this result did not come to pass, in which a wound through the elbow healed speedily without suppuration. Reported by Surgeon Habersham, of Chimborazo. This case can only be explained by the small size of the ball, and its having passed through the joint at its greatest possible momentum, thus making a clean cut through without injury to the articular cartilage or the bone. It may be also in this case that the change of position in the limb, after injury, permitted the skin to cover up the wound in the synovial sack; or again, the sack itself may not have been penetrated, and the ball taken an outer course around the joint itself; for the description of the case does not mention more than the wound and the result.

The length of time that in many cases intervenes between the reception of the wound and the beginning of the suppurating stage, is a source of great danger. From the description already given of the course pursued by traumatic arthritis, and its destructive effects on the articulation itself, we can readily conceive that this may be the brooding time for great detriment to the patient. This arthritis must ensue, sooner or later, when the air is admitted to the synovial membrane, which is always the case in gunshot wounds of these parts. When this condition is established, we think but one resource

remains to us, in order to preserve the patient's life. The joint should be fairly opened, and a free vent given to all the retained and fetid purulent matter contained in it. It should then be kept clean and free from all such collections, by frequent injections of lukewarm water; and a suitable immovable apparatus, if not already in use in the case, should be at once adjusted to the limb. If sinuses and burrowing of pus, have been permitted to form in the adjacent tissue, by neglect in not opening the joint in time to prevent these, they should also be washed out, and injected by some agent that will modify the diseased action in the parts. For this purpose, Tinct. Iodine in water has been highly recommended. Of late years the Tinct. of Coal Tar has established for itself a reputation with the French Surgeons in the treatment of these cases. It is claimed for this preparation, that it destroys the fetor of the secretion, and modifies and diminishes the amount of pus. The walls of the sinuses should be compressed together by suitable bandages, and kept empty, as far as may be, by position.

When this destructive process has once been established, it goes on to the complete destruction of the articular cartilages of the joint, and in some cases induces inflammation, and subsequent necrosis of the bone. The question naturally arises: are we quietly to await the destructive traumatic arthritis which invariably comes on in bullet wounds of joints, induced by the constant contact of air and pus from the tract of the missile, with its attendant disintegration of the cartilages and disease of the bone? In many cases, indeed we may say in all cases, when the large joints, as the knee and hip are implicated, this leads to the setting up of hectic fever, and the death of the patient; or can we forestall the condition by operative interference? As this state of things so destructive to life always comes on,

why should we not open the joint at once by free incisions, and expose the whole of its cavity? By this procedure the fibrous investing capsule and the tough ligament of the joint will be freely divided, all irritant discharges will find vent, and more than this, a correct knowledge of the actual injury the parts have sustained will be come at, and we can then sagaciously determine what subsequent treatment ought to be pursued in the case. No injury can be done either to the part or the patient, for we at once place the articulation in the condition it must invariably come to at some subsequent period, and this too under more propitious circumstances. The patient will be stronger, and better able to resist the profuse discharge that will ensue at this time, than if he waits for a week or more, and the articulation will be opened before these discharges have had a chance of forming and producing deep burrows in the tissues around. In this way much suffering and great constitutional irritation will be avoided.

The incision into large joints immediately after the receipt of the injury, has been strongly advised by Macleod in cases of penetrating ball wounds of the knee-joint; and as this is a joint injury frequently followed by loss of life, when treated on the expectant plan, the advice will with equal force be applicable to wounds of other articulations. It has also received the sanction of Stromeyer, who in the Schleswick-Holstein war, once opened the joint with satisfactory results. We have not had an opportunity of putting this in practice, but for the reasons given, would certainly do so, should the opportunity present itself. [During the campaign of '64, this practice was freely resorted to by myself and others, with encouraging results.] Some primary incisions have been made in Atlanta, Ga., by Surgeon Westmoreland, but the result of the cases at this time have not come to

hand; at last report they were doing well. The synovial sack and the articular cartilage will be destroyed, but this invariably occurs when the articulation is entered by a ball, and in this case the disintegrated detritus will have free outlet, and not be pent up by strong unyielding tissues.

In civil practice, in some of the diseases of these closed sacks, the serous cavities, we are in the habit of injecting Iodine and such allied remedies, with the avowed intention of creating a new action in them. Now would not good accrue in the joint cases, where only incision has to be practiced, and the endeavor of the Surgeon is turned solely to the producing ankylosis from destroying the synovial membrane at the time this primary incision is made by caustics of some suitable kind? The total removal of that membrane is recommended in cases of resection of the joints. By the caustic treatment, we will get clear of much profuse discharge from this membrane which it rapidly secretes, until life is destroyed by the violence of the inflammation excited in it by free contact with air. After this invasion the limb should be fixed, as indeed is advisable in all joint injuries, and should be constantly cleansed from all irritant secretions. The antiphlogistic treatment should be rigidly enforced.

We have in confirmation of this method of treatment cases in which the wrist and ankle-joint have been freely incised to facilitate the removal of spiculæ of bone; as a rule, these cases have resulted well. We are not prepared to state that the employment of passive motion in these cases, where the articulation is opened and the ends of the bones not injured would not restore partial motion to the articulation, for we are aware of cases from disease, where the articular cartilages have been eroded; the bones hardened and eburnated in their facets, in which the joints were moderately useful.

Incisions into articulations, with the results, will be found in the table appended to this report, and just read.

Different results are to be desired and sought for in the superior and inferior extremities. An ankylosed joint in the one is almost useless, and in the other is next to perfect motion, the best result that can be hoped for—giving good and useful support to the body, infinitely better than any artificial appliance.

It is not proposed in this report to discuss the merits of amputation and of the efforts to save useful limbs. In the arm, experience in this and other wars has amply proven that not only is the operation of resection of its articulations less fatal than amputation of the part, but that there often result false joints of great use to the individual. If, then, the main blood vessels and nerves are uninjured, in these joint wounds, amputation should not be resorted to. In his decision on this subject, the surgeon should be guided by circumstances. The general health of the wounded man, the amount of fatigue he has previously undergone, his freedom from scrofula or secondary syphilis, and his "surroundings," or in other words, the conveniences for subsequent treatment of the cases; and last, but not least, in the chain of circumstances, the amount of injury to the soft parts must be taken into serious consideration. In superior extremities, in most cases where the main vessels are uninjured, the effort to save the limb and form an artificial joint, should always be made, if no impediment to a successful result exists in the patient himself.

The injury inflicted on the bone, and the amount of it shattered will always influence the decision. Where, from the result of experience, we are led to hope that artificial joints may be formed, this is not of so much moment. But in those joints where we desire ankylosis, any great extent of destruction, extending through and

beyond the epiphysis of the bone, would at once necessitate the resort to amputation.

In the shoulder, as many as six or seven inches may be ablated, and a limb remain of great utility, with perfect use of the forearm, and a certain power of contracting the loose tissues that hold the lower portion of the bone in connection with the shoulder. This is beautifully exemplified in a case reported by Assistant Surgeon Wilson, of Camp Jackson hospital. In this case the motion of the forearm is perfect, and when the patient had a splint bandaged on to the arm and shoulder, slight power of bringing the arm forward over his chest. Six inches of bone had been ablated in this case, and no contraction, or very little, had taken place. The arm could be twisted round on itself, yet there was some little power in the muscles that had attached themselves to the skin in fixing the forearm. This case has been reported at length in the *C. S. Journal*, and is doubtless familiar to all. In the elbow a considerable portion of the humerus may be excised and a useful joint remain, and so long as the attachment of the biceps remains to the radius, there seems to be no limit to the amount that may be removed. We have had under observation a case in which the distance between the ends of the bones was four inches, and the arm was strong enough to raise a bucket of water. In the wrist the importance of preserving, if possible, the use of the hand and the play of the finger muscles, induces us in most cases to attempt its preservation by resection of the carpal ends of the radius and ulna, and even of portions of the carpal bones.

The question with regard to the Coxo-femoral articulations hardly admits of a doubt. It is either between certain death or possible recovery, that the selection is to be made. The records before us and those reported by surgeons in other wars, teach us that all wounds impli-

cating this articulation, and treated on the expectant plan, without surgical interference, are fatal. Hardly a better result than this can be said to follow from amputation at this joint; an exceptional case may recover, but we must not be governed in our decision by results of this kind, that are, from their rarity, almost miraculous. Resections of this joint, during this war have as far as our information goes, been made three times, twice in the Confederacy, and once by a Federal surgeon on the person of a Confederate soldier. Two of these cases recovered with useful limbs; the third case was unsuccessful; the condition of the part, owing to over work and to the crowded state of the wards of the hospital were not recognized until the strength of the patient was sapped too far. But even in this case the excrutiating pain experienced by the patient was entirely relieved, and he sank quietly and painlessly to his grave. In the Crimea, all cases of this wound, not treated by resection, died; and of the six resected, one lived, with a useful and strong limb.

The operation of resection in penetrating wounds of the knee joint have not generally found favor with military surgeons. The size and complexity of the articulation, and the absolute need of perfect and continuous adaptation of the divided ends of the femur and tibia, and the wearisome length of time requisite for the treatment of the case, have always induced them to resort to amputation in the lower third of the thigh. So few resections of the knee joint have been accomplished in our service that no facts can be deduced from them; of course the most desirable result in these cases is bony union in such a position as to be useful to the patient for walking; for this purpose bony or strong fibrous union, which finally may change with time, is sought to be obtained. The difficulty of this perfect adaptation and

retention of the ends of the bones in apposition, we hope to do away with by the method to be described, when treating specially of resection of this joint. It seems to us that as this operation of resection of the knee has resulted so favorably in civil practice, it is well worthy of a more extensive trial than has been accorded to it in this war. Macleod mentions but one resection of this joint in the Crimea, and this went on favorably, and partial union took place between the divided bones; the discharge diminished in quantity, and the external wound looked healthy, and had nearly healed across the front. The restlessness of the patient, naturally a reckless person, caused some difficulty in preserving the immoveability of the limb. This patient, after doing well for some time, succumbed under an attack of diarrhœa and vomiting. He had not the appearance of a man suffering with pyæmia, but seemed simply to die exhausted by sickness and diarrhœa.

The chairman of this committee has resected the knee joint three times during the war, with two deaths and one cure. The fatal cases were secondary, and when the operation was made, were suffering from the exhaustion of profuse suppuration. The resection was selected in preference to amputation, which, from the disorganized condition of the thigh, would have been made in the middle third as a less grave procedure, and one in which there would not be so much shock or nearly so great a loss of blood; the patients also strenuously objected to amputation. Had they been submitted to amputation they would hardly have left the table alive. The cases resulted fatally, but they lived and suffered so slightly from shock, and had so light a reactive fever, that great encouragement was felt to resort to such operations in future, especially as secondary amputations of the thigh for knee joint injuries had

resulted fatally. In the other case, the operation was secondary to the reception of the injury, but primary as to the condition of the joint and synovial membrane, for traumatic arthritis had just manifested itself, and no suppuration had yet taken place in the articular cavity. The patient recovered in one hundred and twenty days; the external wound was closed, the cicatrix was firm, and no sinuses existed. There was firm fibrous union of the two ends, which in time will doubtless ossify. The want of osseous union at this time results from several causes. The necessity that existed of changing the apparatus used, which was constructed hastily, on the 4th or 5th day of the treatment. By this movement the precise adaptation of the ends of the bones was interfered with, and some granulations injured, as was shown by a hemorrhage, that came on soon after, for at this time the granulations could be seen cropping out from the two bones. The result of this case is encouraging. A full report has been sent to the Surgeon General.

These operations in joints should always be primary, or if secondary, after suppuration has been fully established and the system has become somewhat accustomed to the injury it has received. Intermediary operations are inadmissible. Interference at any time during the stage of acute arthritis, except to let out the putrid contents of the synovial sack, will only increase the constitutional disturbance. After the seven days' battles around Richmond we saw two fatal results from excision of the elbow joint, during the intermediary stage. We must in such cases see that free incisions are made to let out the secretions, and quietly bide our time for interfering. It is established by the records of military surgery that all excisions of joints should be complete, that is, all the articular cartilage in the joints should be ablated, and experience teaches us that better cures in cases result

when this is done, for the cartilage, if not removed by the operator, must be always, by a much slower and more tedious process, that of disintegration from want of nutrition. In joints where motion is preserved after these resections, the ends of the bones become rounded off and covered by a strong fibrous envelope.

	No. of cases	Primary	Secondary	Deaths	Per cent	Cases	Deaths	Per cent
Baudens	14	..	..	1	7.1	..	..	..
Schleswick Holstein War	19	..	..	7	..	..	..	..
CRIMEA—								
English Army	10	..	..	3	36.9	..	..	..
French Army	38	..	..	21	18.8	..	..	..
Confederate States' Reports	66	41	..	13	55.3	180	46	25.6
	..	..	25	7	29.06	66	20	29.6
Total						246	66	26.09

The results of these operations are very satisfactory. The hand preserved most of its movement, and the arm in many cases could be moved slightly forward and backward, there was little power, however, of abducting the arm, owing, we surmise, to most of these cases having been performed by the circular section through the deltoid. There can be found in our own records many cases reported as resected, in which no result has been given; those, of course, have been omitted in the report. Comparing the result of these cases with that of wounds of this articulation treated without excision, we find seventeen; three cures, six deaths, and five useless ankylosed limbs, and six cases in which the result is not stated. The percentage is less than that given for amputations at the shoulder joint, and has the advantage of leaving a most useful member.

Gunshot wounds of the Scapulo-humeral articulation are to be resected in all cases in which the head of the bone is injured, and the blood vessels and nerves that pass to the arm are intact. The glenoid cavity and the

head of the humerus, if injured, should be resected at the same time. These resections are usually partial, that is to say, the articular cartilage is not usually severed from its adhesion to the scapula. It is difficult to place a limit to the length of the piece of the humerus that may be taken away and still a limb useful for many purposes remain. In the reports of cases we find that as many as six inches have been ablated and good results obtained. We refer again to the case reported by Dr. Wilson as in point.

In the cases we have examined, some time after the healing of the wound, only a to and fro motion could be given to the arm, and no elevation from want of a fixed point for the humerus to work against. Desault says, "The simplicity of an operation is its perfectness." Various incisions have been, and are, employed by surgeons in the performance of this resection; many, after Stromeyer, make a semi-circular, horse-shoe-like, cut through the deltoid, severing the muscle entirely in two; others prefer the simple vertical incision through the deltoid, extending from the acromion as far as such case may require, and if this be not found sufficient to permit the head of the bone to be dislodged from the glenoid cavity, from the lower edge of this incision another may be made, carried backwards and upwards, making a posterior flap with its apex downwards. In our opinion, much of the subsequent utility of the arm will depend upon the incision made, so as to expose the articulation. The single verticle incision certainly possesses advantages over any other, for if the bone be sawed through above the insertion of the deltoid muscle, by avoiding the transverse section of its fibres, we preserve all the power of the contraction of the muscles, and have the end of the bone drawn up to the glenoid cavity. Stromeyer's statement, that the lower portion of the cut deltoid attaches

itself to the glenoid cavity, is not sustained by our observation.

We have had the opportunity of examining many of the resections of the shoulder, performed both by the curved section across the fibre of the muscle, and the straight one, made longitudinally with its fibres. The difference in these cases was striking.—The curved incisions leave a large, deep, ugly cicatrix, which has a tendency to ulcerate by the rubbing of the patient's clothing; there was no attachment of the muscle to the head of the scapula, but all the muscular fibres seemed to run into the cicatrix; the shoulder was flat, and the acromion prominent. The deltoid was evidently atrophied. Where the vertical cut had been used, the arm was shortened, if the section was not below the insertion of the deltoid muscle. The roundness of the shoulder was better preserved, and the cicatrix instead of being exposed was depressed and protected from pressure. Some stress has been laid, that the line of the incision should, if possible, include the wound or wounds; this, we belive to be of minor importance. In a case of secondary resection of the shoulder, performed at General Hospital No. 4, a single straight incision was made, and neither the orifice of entrance or exit were included, and the head and one inch of the humerus removed. The lips of the wound were nicely adapted with ordinary sutures. The wound healed by the first intention; the discharge from the joint continued from the wound of exit, situated behind. The case resulted happily, and there remained a most useful limb. When the patient was discharged he had slight use of the deltoid, in abducting the arm. I have no doubt much more power was subsequently developed by time and use.

In all resections of joints, we think it highly injudicious to compress the main artery, for by so doing we deprive

ourselves of the important knowledge of its locality, communicated to the fingers by its pulsations, while we are dividing tendons and muscles in its vicinity; moreover, secondary hemorrhage is one of the most usual accidents that follows resection. By thus compressing the main artery, the articular and circumflex branches divided, do not bleed, and the subsequent handling of the part, during the operation, prevent their spurting when the pressure is removed, and thus they are not ligated, and when reaction comes on start afresh.

The operation itself is simple and easy, a straight incision is made of the required length for the acromion, down to the head of the bone, and as far as needed along the shaft, by one cut of the scalpel the parts are easily separated. The long head of the biceps pushed inwards out of the way, the capsule is opened, and the head of the bone dislocated by manipulating the arm, or if this be impossible, by seizing the upper portion of the bone, with the lion forceps—all spiculæ of the bone, are now to be carefully picked out of the wound. The upper and lower part of the incision may now be closed with sutures, and if there be a posterior wound, the whole line may be closed, and an attempt made at union. A soft pad well covered with oiled silk, or rubber cloth, should be placed under the arm from the axilla to the elbow, and the arm and forearm, then bandaged closely to the chest when the wound has nearly healed up again, motion must be resorted to.

RESECTION OF THE ELBOW JOINT.

	No. of cases	Primary	Secondary	Deaths	Per centage
Shleswick	40	..	..	6	15.0
English Army	20	13	..	3	..
Crimea	..	3	4	4	..
Partial recovery	..	..	..	..	..
Confederate States Reports	45	22	..	3	35
			23	6	20

The results of the operation are highly satisfactory, for if useful joints do not always remain, the ankylosed joint can always be placed in the position that renders it most useful to the patient, and the perfect use of the hand is preserved. Both articular facets should be removed, for although good joints have followed partial resections of the elbow, the experience of surgeons runs, that complete resections heal more rapidly and are attended with better results. Macleod states: "Partial resections, of which there are a great many cases, did not, I think, turn out as well as complete ones; they were more tedious, more liable to fail, and less satisfactory when they succeeded, than when the whole articulation is removed." In these cases it is proper to remove more than the articular facets, although they alone be injured, in order to prevent ankylosis; a large extent of bone may be removed from the lower end of the humerus, but of the radius, if possible, the insertion of the biceps should be preserved. The vertical incision fulfills all the indications required; it should be free, and made directly through the tissue at the back of the joint, at one cut, down to the bone, the soft parts should be carefully cleared away, and the ulna nerve sought for and pushed out of its groove to the inner side. Wounds of this nerve may be followed by atrophy of the forearm, and at least will be attended with less sensation of the little and ring finger. The ordinary care of protecting the soft parts and vessels from the saw must, of course, not be omitted. Stromeyer states that the joint should now be fixed on a splint and not be removed from this whilst being dressed, and it must be elevated so as to prevent œdema of the forearm; it must be flexed at an angle of 130° to 140°.

Early passive motion must be resorted to as soon as suppuration has diminished, and before cicatrization is complete. Little reaction ensues in these cases; cold

dressings should be applied as long as the condition of the part indicates their use. By judicious after treatment an amount of motion is obtained but little inferior to the natural joint. In the fifth volume London Lancet, page 231, 1855, Mr. Syme reports the appearance of an elbow joint nine years after resection. The ulna was found united to the humerus by ligament, the end of the radius was polished off and played on the ulna and humerus, a material something like cartilage, being interposed. The ends of the bones of the forearm were locked in by two processes, projecting downwards from the humerus, and posterior ligaments bound them to the latter bone. Mr. Robert states, in these cases, that flexion is a compound movement, the forearm being first drawn up to the humerus by the triceps and then flexed by the biceps. This action we have observed in three cases that we have examined two years after operation. In some cases flexion cannot be made unless the arm be fixed by a weight in the hand.

RESECTIONS OF THE WRIST.

	No. of cases	Primary	Secondary	Deaths
Sorrel's reports	3	2	1	1

Cases of gunshot injury of the wrist joint requiring resection are of rare occurrence. In the majority of cases the enlargement of the wound for the removal of shattered bone suffices, as for this purpose lateral incisions on the outer side of the bones may be made, through these incisions the ends of either the radius or ulna may be turned out and cut off with the saw or bone plyers. When we take into consideration how closely the tendons are bound down by the annular ligament, we will at once recognize the extreme difficulty of pushing them out of the way of the saw. Legouest and others, on this account, and because of the stiff and useless state of the fingers

that remain, advises against the operation. We have ourselves no experience thus far, and find nothing in the surgical reports bearing on this subject. Should this operation be performed, great attention should be given to the early use of passive movement, so as to keep the tendons from forming adhesions.

INFERIOR EXTREMITY "HIP JOINT."

	No. of cases	Pri-mary	Sec-ondary	Deaths	Per centage
Crimea	6	5	..	4	83.3
Sorrel's reports	3	..	3	1	33.3

We find upon recurring to our table of wounds of the joints treated by the expectant plan, that eight cases thus treated died, and that there were no recoveries. This was also the experience in the Schleswick Holstein war, and in the Crimea. Three cases in the present war were submitted to resection, two with admirable results, and the other, although terminating fatally, with great temporary relief to the patient. Looking at these facts, and at the almost equally fatal results of amputation of the coxo-femoral articulation, we must come to the conclusion that when the head of the femur is injured by a ball, the only chance of the sufferer lies in prompt resection of the joint. The useful limbs that are retained after this operation would, other things being equal, give it the call over amputation, and the expectant treatment, which at best, could only result in an ankylosed joint, with sinuses from carious bone. In the Crimea, O'Leary's case recovered with a very useful joint.

Of the two cases reported by the chairman of this committee, one recovered after the resection of the head of the femur and over six inches of the shaft of the bone. As will be seen by a letter just received, and part of which is now submitted to the association, his limb is near six inches short, but has tolerable motion and strength. The other case will be found reported in the journal, and must

be familiar to all, as the person has been seen by many, walking about the city with a useful leg. Jarret promises to be in Richmond early in May, and if possible, will be presented to the association for examination. The case that resulted fatally has also been reported.

An analysis of the cases in the Crimea, quoted by Macleod, shows that of the five cases that died, two died from exhaustion, one from pyæmia, one doing well up to his seizure with Asiatic cholera, at that time prevalent in the camp, and one from some cause unknown. Another remarkable fact, perhaps worthy of note, is that in but one of these cases was the capsule of the joint opened, or did the fracture extend to the ephysis of the femur. The same condition existed in Jarret's case. In the case of Tony, who died, the ball was in the cotyloid cavity, between the head of the femur and its wall. This case was noticeable from the extreme pain that existed in the whole leg, until after the head of the bone and the ball were removed, the articular cartilage in the cavity was loose and came off readily by traction with the finger nail.

Taking into consideration the deplorable results that ensue from compound comminuted fractures of and above the trochanter, and the great length of time they take in treatment, the necrosed bone left for years, if they ever do recover, would it not be safe surgery in these cases to excise the head of the bones? Instructed by the disastrous results of these cases in our hands, and encouraged by the cases of O'Leary and Jarret, we have been thinking seriously, that in fractures of this sort, resection is perfectly justifiable, and even demanded. We can at this time call to mind one case that was brought to General Hospital No. 1, in this city, from some other hospital, in which the patient had been bed ridden for many months, over a year certainly, and in which the end of the femur

was drawn upon the outer and posterior portion of the illium near to its crest. The condition of this man was deplorable to behold; the end of the bone was necrosed, and with the most fortunate result that could happen to him, the limb was useless. The articulation to be opened is not a large one, although it is deeply seated; it compares only with the shoulder. The results of resection are so encouraging, and we can see no reason why, taking into our estimate the greater danger in the lower extremity of all capital operations, it should not in many cases succeed. The danger in these hip joint wounds is not primary, but is the result of exhausting suppuration, and pyæmic poisoning. These accidents are in a great measure avoided by resection of the head of the femur. Traumatic arthritis and its dangers are, by this ablation, put entirely out of the way, and the purulent secretions, instead of burrowing under and between the tissue, have outlet through the incision made, and the chance of saving life is increased. By the expectant plan there is certain death; by resection, a possibility of recovery with a useful limb.

Various flaps and incisions have been advised and practiced in this operation. The simple vertical incision answers all purposes. The patient should be placed on a table of convenient height, lying on his sound side, his face turned to the edge of the table, or outward. The surgeon standing at the opposite side of the table at the patient's back, makes with a strong scalpel, an incision over the edge of the trochanter major down to the articulation. The length of this incision varies with the amount of the femur to be excised with the head of the bone; it should be at least five inches in length, extending two or three inches below the trochanter, the joint should be reached by this incision, the capsule must then be opened; an assistant standing in front of the patient

now places the joint on the stretch and dislocates it backwards, by seizing the extended leg, rotating it strongly inwards, and then pushing it from him under the edge of the table. This places the joint fully on the stretch; the surgeon now divides the ligamentum-teres. If it be possible to divide this, the muscular attachments to the trochanter and its fossa must be cut, and all difficulty will be overcome. The bone must now be divided with the saw, and all loose spiculæ, many of which may be found drawn into the surrounding tissues, should be carefully picked out; little bleeding occurs, and no ligatures are usually required. The ends of the incision may now be closed, but a large vent must be left for the escape of the secretions. If the acetabulum be found injured, the loose portions must be taken off with the forceps. In case of the head of the bone being separated from the shaft, great difficulty will be experienced in separating the round ligament. The head of the bone must be seized by the "lion forceps" and dislocated by means of them.

Many lay great stress on fixing the parts immoveably. This does not seem of great importance; all that is requisite is to apply a bracketed splint so as to prevent the end of the femur from pushing against the wound, and this must be so applied as not to interfere with the contraction of the muscles, which tend to shorten the limb, by drawing the end of the bone up to the acetabulum. The wound should be often washed out with warm water, or some preparation as suggested before, that has a tendency to restrain the excessive suppuration. Bagging of pus must be prevented by the suitable adjustment of pads and pillows. The double inclined plane has been advised, but seems objectionable, for it prevents the needed contraction of the thigh muscles.

RESECTION—KNEE JOINT.

	No. of cases	Pri-mary	Sec-ondary	Deaths	Re-covery	Per centage
European Surgery	35	..	..	34	1	97.01
Confederate States' Reports	6	..	..	5	1	..

In the Crimean war, one case only of resection of this articulation is mentioned by Macleod. The patient for some time did well, but succumbed to an attack of intestinal derangement, induced by eating apples. We find in the tables given of wounds of joints, recovery without surgical interference, ninety-nine cases of knee joint wounds there set down, with forty-five recoveries and fifty-four deaths. These statistics show also twenty-four cases of knee joint wounds, said to be doing badly. These it will be fair to put down as dead by this time, as no subsequent note has been made of them. Macleod states that in the year 1854 he saw forty cases in the French hospital, all of which resulted in death, save when primarily amputated. In the Indian reports, he states, in a "note," that he has been able to find the particulars of nine cases in which the knee was penetrated, but the injury was apparently so slight as to lead the attendants to try and save the limb; every one died. Alcock has stated, as before mentioned, that the proportion of cases in which the articulations are wounded, to other gunshot wounds, are between four and five per cent., nearly half of which were in the knee; of thirty-five cases, in which the knee was more or less implicated, twenty-two lost their lives and eight their legs. After such results he says: "It is little to say that the five who recovered preserved good and useful limbs." These results are very different from those shown in our table, and correspond so little with the experience of all the surgeons with whom we have had occasion to speak on this subject, that we are forced to conclude that either the successful cases being wonderful are reported, and

the dead not numbered, or that they were peri-articular, the joint itself not being implicated.

In civil practice, the resection of this joint for disease, has been attended with the most favorable results, as to life and the subsequent utility of the limb. The mortality is less, according to Mr. Ferguson, than after amputation in the thigh for disease of the knee joint. We have lately had the pleasure of meeting a surgeon from London, and in discussing the subject, he stated that a few days before he left that city, at a clinique of Mr. Ferguson's, he had seen three cases, in which resection of the knee had been performed some time before, and that the gastroc-nemei muscles were developed in proportion to the time that had elapsed from the operation in each case. The great mortality in field practice can satisfactorily be accounted for by the surroundings of the soldier, and the want of necessary appliances for the treatment. The nice adaptation of the divided ends of the bone; the perfect fixedness of the parts; so as to prevent the least motion; the assiduous attention to nourishment, and correct diatetic regulations; and the perfect repose of a separate apartment, cannot be obtained in the field, where, after the operation, the patient may have to be moved many miles over a rough road, in jolting ambulances and crowded cars. Mr. Ferguson justly sums up the advantage of this operation in civil practice. The wound is less than an amputation of the thigh; the bleeding seldom requires more than one or two ligatures; the loss of substance is less, and probably on that account there is less shock to the system; the chances of secondary hemorrhage are scarcely worthy of notice, as the main artery is left untouched; there is, in short, nothing in the after consequences more likely to endanger the patient's safety than after amputations, while the prospect of retaining a useful and substantial limb, should encourage

both patient and surgeon to this practice. Were all the conveniences for treatment in the field as in private practice, the reasons would be equally forcible. The patient not being a sickly, puny, scrofulous child, but in the full vigor of manhood, would have more strength to resist the shock, and more recuperative energy for the building of the connective tissue.

It certainly appears right that conservative surgery should be attempted in some of these cases; for the ruthless amputation for all gunshot injuries to the knee joint, is an opprobrium to military surgery. When the accident happens in the neighborhood of good hospital accommodations, and the injury is confined to the articular ends of the bones, and does not extend beyond the epiphysis of the bones, it seems worthy of trial, as the limb that results is superior to any artificial appliance. Moreover, we have seen that where the articulation is opened, and slight injury only has been inflicted on the ends of the bones, or rather the articular cartilages, primary incisions have been attended with good results, and that in all these cases, as far as we know, ankylosis results from the destruction of the cartilages of the joints, and that the union between the ends of the bones is fibrous, or better still, osseous. It is certainly rational to think that this danger would not be aggravated by sawing through the epiphysis of the bones and bringing their raw facets in immediate contact, so that the granulations that rapidly spring up from healthy bone when cut, could speedily cover the ends and unite the opposing granulations. In disease, and when the joints are opened, before this union can take place, destructive ulceration of the cartilages must occur.

The following case is taken from Macleod, illustrating the post mortem examination of the knee joint after resection for gunshot wound: "Death twenty-seven days

after resection; post mortem fourteen hours after death. Before removing the body to the dead tent, the orderlies had taken off the splint, and the limb had been allowed to hang down, so as to destroy any points of union there might have been. The wound had healed, except its extremities, the granulations of which had shrunk and assumed a black appearance (post mortem). The opposite surface of the bone presented a very similar appearance, and there was no sign of dead bone. They had become moulded to one another in shape. Whether there had been any union towards the centre was not evident; at the circumference there were appearances of adhesion having been broken. The cavity of the joint contained only a small quantity of pus. The abscess in the outer part of the thigh had almost healed, the viscera healthy."

One case of resection of the knee has resulted well in General Hospital, No. 4, in the case of Capt. Knowlton, wounded in the battle of Payne's farm. This case has been reported in full to the proper authorities, and we will only mention here some of the leading points that bear on this subject. The leg was strongly flexed upon the ham, where impinged upon by the ball (a minnie), which after touching the articular cartilage and opening the synovial sack, turned up, and was removed on the field, by an incision near the upper edge of the patella; it had formed a groove in the outer condyle of the femur, and barely touched the cartilage. There was no discharge of the synovia, and up to the tenth day after admission; the twelveth after the injury no serious symptoms ensued; on the tenth the joint became painful and swollen, he had two slight rigors, and some slight febrile excitement on the eleventh day. These symptoms being on the increase, and traumatic arthritis being imminent, with the advice of Surgeons Gibson and Michel, it was decided to excise

the joint. The secretions of the capsule were found thin, turbid, filled with fibrous flocculi. The synovial sack was slightly reddened, the cartilages and bone were healthy; about two and a half inches were sawed off, in the endeavor to cut away the groove made by the ball, the patella was dissected away. The section of the bone was made obliquely downward and backward for the femur, and the reverse for the tibia, so that when brought into apposition the leg would be slightly bent, and the toe inclined forward and downwards. The ends of the bone were snugly fastened together with silver sutures, no vessels were ligated, and before the patient was moved from the table the leg was placed in a long fracture box, extending from the nates to below the foot. This box had moveable sides. The leg was well padded under the knee so as to prevent the bones breaking out the wire sutures by their weight, being unsupported in the popliteal space. After some days this box was removed and the leg merely adapted to bracketed splints. This patient's general health and temper rendered him peculiarly unsuited for such an operation. He was naturally irritable and discontented, and subject to hepatic derangement. In four months the internal wound was closed, one of the wire sutures remaining in the limb, but seemed to give no trouble. The union between the ends of the bone is firm, but permits of slight motion,.when the limb is taken between the thigh and leg. It can support itself to be lifted up from the heel. The patient left the hospital with the leg strengthened by a leather splint.

As resection of this joint under favorable circumstances has so seldom been performed in this war, your committee will not hazard at this time an opinion as to the comparative results of resection and amputation for injuries that penetrate its cavity, without inflicting much damage on the articular ends of the bones, we, however, in view

of the great advantage of the limb retained, even if stiff and slightly shortened, over the artificial limb that must be used in its place, are much inclined to resection when the condition of the patient or his age will warrant, in the surgeons opinion, such proceeding, and suitable appliances are at hand. In many cases, as in Capt. Knowlton's, the synovitis does not set in for days, and there is generally plenty of time to send the wounded man to some neigboring hospital for treatment or operation, fixing the joint for this purpose firmly in the bracketed splint, that will shortly be described. It would be safe and judicious practice in the field to examine all wounds of the knee joint, or in its vicinity, enlarging the opening freely for this purpose, so as to ascertain clearly the exact condition of the articulation. If this be found to be much implicated, with destruction of epiphysis of the bone or the splitting of the shaft in the joint, no harm is done, and the case can be completed by amputation. If there be found but slight injury to the articulation, so that a section of the shortened ends will not take off more than two and a half inches from the length of the limb, or open the medullary cavities, and if the vessels and nerves be uninjured, then resection may be attempted with prospect of success. If on the other hand it be found that only the sack be opened and cartilage uninjured, the free incision will expedite the treatment of the case.

The horse shoe incision is the one generally used in this resection, extending from one condyle to the other over the front of the joint under the patella. The tendon of the extensor muscle is now divided, and the flap containing the patella turned up. The joint is then opened by flexing the leg strongly on the thigh, the ligaments are divided and the bones cleansed of the soft parts as far as necessary, care being taken not to injure the vessels running along the back of the joint through

the popliteal space. The soft parts should now be protected by a wooden spatula or a piece of leather drawn over them, and held out of the way by an assistant. The end of the femur must now be divided with the saw, taking care to make the section in such direction as to insure the after adjustment in the way that will best conduce to the production of a useful limb; the tibia is now to be divided by the saw, in these sections we must be careful to conform ourselves to the epiphysis of the bones.

The removal of the patella is still a mooted point, some Surgeons taking it away and others allowing it to remain. In Knowlton's case it was removed. If it be not ablated it must be twisted over, and its articular cartilage shaved off with the scalpel, and we must attempt to procure union between it and the anterior aspect of the ends of the femur and tibia. In civil practice we find an average gain, in the treatment of cases in which the patella is cut away, of thirty days. In Dr. Hodge's tables, the duration in the treatment of forty-eight cases in which the patella was removed is stated to have been 225 days; where it was not removed 255. The average duration of treatment in these cases was eight months. In Knowlton's case the time was four months, or just one-half of the time required for the treatment of cases in civil practice.

If the ends of the femur and tibia after this first section are not perfectly adjustable, then sections must be made until this is secured. These two bones should be then firmly tied together with sutures of strong silver or annealed iron wire; the ends of the wire should be left long, and be carried out of the side incisions, rather at the bottom of the wound, as the part that will heal last. The little instrument devised and employed by Surgeon Bolton for ununited fractures, would answer admirably for this purpose, by being placed on each side of the joint,

and then by the use of the screw, the ends of the bones could be pressed firmly and perfectly together. The incision through the skin should be closed by sutures, taking care to leave room enough for that discharge to pass through at the lower edge of the wound.

The limb from the foot to the knee should now be covered with a double layer of cotton wadding, or sheet tow, over which an uninterrupted bandage should be applied. The same should be applied to the thigh from the groin to the knee. As these dressings are to remain untouched for a long time, they should be guarded from soiling near the wound by oiled silk. A well padded posterior splint, extending from the middle third of the thigh down to the tendon of posterior muscles of the leg, cut out so as to be narrow under the knee, and padded so as to fill up the popliteal hollow, protected here likewise with oiled silk, should now be firmly fixed to the leg. A Smith's wire splint, bent up to an angle at the foot, may be bound tightly to the splint, and will answer all purposes of a foot board, and will keep the foot from twisting the knee by any lateral motion. By means of this posterior splint, bent so as exactly to fit, we can keep pressure on the leg, and so hold the edges of the bone in contact. Two long splints, interrupted at the incision opposite the joint, are now to be placed on either side of the limb, extending from the upper side of the thigh to the sole of the foot. These must be nicely padded, and may be held in position by strips of bandage tied at different points, so many as may be needed. The limb may be suspended from a Salter's apparatus, or by some extemporaneous contrivance.

Dr. Howell Thomas, of this city, on duty for some time at General Hospital, No. 1, under charge of Surgeon Gibson, has ingeniously adapted Smith's anterior splint to the purpose of bracketing the long straight splint, by

bending them into suitable shape and bandaging them firmly to the splint, which are then cut out corresponding to the elbow made by the wire. The ends of the wire splint, if too long, may be bent laterally on the sole of the foot, then placing this in a firm wire box. This arrangement preserves perfect immobility of the limb, and permits the dressing to be applied and changed as often as may be requisite. They are readily extemporized and might be of use in wounds of joints in the field; if suspended from the roof of the ambulance, or car, the patient could travel without much jar or jolting.

A Mr. Jones is mentioned in Erichson, who was in the habit of excising the knee without dividing the legamentum patella, but he began his operation by making the ordinary horse-shoe cut in the skin.

The Chairman of this Committee, appreciating the importance of preserving the tendenous attachment of the anterior muscles of the thigh, so that it might act antagonistically to the ham-string muscles, has twice of late, on a dead subject, performed resection of the knee on this wise: From the lower edge of the patella, whilst the leg is extended, an incision is made through the skin into the joint and carried down to the ham-string tendons; this is done on both sides—at its middle this is crossed by a verticle incision, two inches in length; these flaps are dissected back. The knee is strongly flexed, and the lateral and crucial ligaments are divided, cutting from below upwards. The soft parts are carefully and slowly cleared away from the back of the femur with the finger and handle of the scalpel and perhaps a few touches of the knife, keeping the edge near the bone. This part of the operation must be carefully proceded with and the pulsations of the artery should be sought for so as to keep the edge of the knife away from it. A piece of soft leather being now passed under the condyle of the femur, the

soft parts are strongly depressed by an assistant; another assistant, by means of a strong piece of bandage, holds up the patella and its ligaments. The blade of Mr. Butcher's saw is now passed in, the handle attached, and the bone divided, cutting from below upwards. This is repeated for the head of the tibia, and the patella being everted and its cartilage being sheared off, the operation is complete.

Resections of the ankle joint for gunshot wounds penetrating the articulation, are rarely performed. Most Surgeons, owing to the complex arrangement of the synovial membrane of this joint with the tarsal articulations, and the bad results that have often ensued from the wounds, have inclined to have recourse to amputation. Macleod states, however, that penetrating wounds of the ankle did well, although they demanded long treatment. This, he says, is opposed to usual experience in such injuries; and he further remarks that where the openings were largest the patient did best.

We find in our table of incisions of joints, five cases with one death, which support this statement.

If resection be determined on, a straight incision on either side of the joint will enable us to throw out the ends of the tibia and of the fibula, and saw them off. Generally speaking, however, the simple enlargement of the wound, and careful extraction of loose pieces, will fill all indications. The foot, during treatment, should be permanently fixed, as ankylosis must result. On two occasions during this war after months of assiduous care, we have been compelled to amputate at the lower third of the leg.

ARTICLE VII.

Relations of Pneumonia and Malarial Fever: with Practical Observations upon the Antiperiodic or Abortive Method of Treating Pneumonia. By Joseph Jones, M. D., Professor of Chemistry in the Medical College of Georgia.

The great mortality caused by typhoid fever and pneumonia in the hospitals and armies of the Confederate States, invested these diseases with peculiar interest and importance.

After a careful examination of the official reports, on file in the Surgeon-General's office at Richmond, Va., we established the important fact, that up to the time of this examination and consolidation of the sick reports, and mortuary records (September, 1863), pneumonia and typhoid fever had caused one-half of all the deaths from all causes, gunshot wounds included, in the field and general hospitals. We were led to draw up extended reports, presenting the results of our investigations upon the causes, nature and treatment of the most fatal diseases. The manuscript volumes thus prepared for the use of the Medical Department of the Confederate States were captured or burnt at the time of the evacuation of Richmond.

In the report upon pneumonia, we urged that each medical officer of the Confederate army, should as far as possible, test the value of the different modes of treatment before the profession. Whilst there existed no want of theories, of positive assertions, and of unbounded confidence in special remedies in the treatment of pneumonia; unfortunately, however, the experience of which

we heard so much, availed but little in the accurate determination of practical questions, involving as was carefully and fully demonstrated, the lives of a great proportion of those afflicted, and in truth, of thousands of the brave defenders of their country. It is customary to dignify with the title *extensive experience*, the use of one or more remedies for a series of years amongst a number of patients, regardless of the intelligence which selected those remedies, regardless of the fact whether those remedies were selected as the result of education, or of accident or prejudice, or as the result of careful and conscientious investigation and comparison of the relative effects and value of different modes of treatment. It was urged, that under all circumstances of peace or of war, and especially in a contest in which the entire community was emptied of its male population, from boyhood to old age, and from the statesman to the day-laborer, such investigations should be considered of the greatest moment, and should be conducted with the most scrupulous accuracy and honesty; and the belief was expressed that with concert of action, amongst conscientious and competent observers, results of great value would be achieved.

In medical science, as well as in sciences of more exact observation, no other method except that of strict induction from well observed facts will result in the establishment of fixed and general principles, which will express with truth the operations of nature, and enable man to guide and direct them in fixed modes for the accomplishment of useful ends. Hypothetical discussions of disease, and of the action of medicines, apart from established facts, are worse than useless—they are positively injurious, by calling off the mind from rigid experiment and from the careful observation of nature.

In Therapeutics we need above all things, rigid obser-

vations upon the effects of the different agents on the duration, progress, effects and termination of particular diseases.

In every inquiry in Therapeutics, the physician should endeavor to determine—

1st. The natural progress of the disease when no remedies have been used: What is the natural history of the disease: What are the tendencies of the disease—to recovery, or to death. The relative mortality to the total number of cases and to other diseases: When recovery takes place what is the process; and when death takes place, what are the antecedents, and the immediate causes. The effects of variations of climate, of previous habits, of diet and of age, as well as the extent and severity of the inflammation or disease should be accurately noted; also the effects of various modes of diet and stimulation.

The results of such investigations will form a standard by which the value of different remedies may be determined. Every conscientious physician desires to dispense with all needless medicines; and if it were possible to treat certain diseases by aliment alone, with more success than with drugs, it would be the duty of the physician to conform the treatment to the established course of nature.

2d. Whether the remedies used diminish the rate of mortality in particular diseases, and thus contribute to the safety of the patients.

3d. Whether the remedies abridge the course of the disease.

4th. Whether they lessen the sufferings.

5th. Whether they leave any injurious results.

6th. The modes in which the remedies assisted nature in the relief of the disease.

With a number of physicians, thus acting in concert, even if each one experiments with and records his experience with only a single remedy, and that his accustomed and favorite one, it will be possible, in the course of time, to determine with an approach to accuracy, the most efficacious remedies and modes of treatment.

In the report referred to, the various modes of treating pneumonia were classed under the following heads:

1st. *Dietetic System.*

2d. *Rational Treatment designed to further the natural progress of Pneumonia towards recovery.*

3d. *Antiperiodic, or Abortive Treatment of Pneumonia.*

4th. *Antiphlogistic System of Treatment.*

The following table was drawn up from the official field and hospital reports, with the design of comparing the results of the treatment of pneumonia by Confederate Surgeons, with the mortality under different systems of treatment:

TABLE Illustrating the Rate of Mortality in Pneumonia under Different Modes of Treatment. Prepared from the Hospital and Field Reports of the Confederate Army of America, and also from the published statistics of various European Hospitals and Armies. By JOSEPH JONES, *Surgeon in the Provisional Army of the Confederate States.*

NAME OF HOSPITALS AND PHYSICIANS	LENGTH OF TIME	SYSTEM OF TREATMENT	No. of Cases of Pneumonia	No. of Deaths from Pneumonia	Per cent. of Deaths in Cases of Pneumonia	One Death in — Cases of Pneumonia
Confederate forces serving in S. C., Ga. & Fla.; mean strength 25,670; field reports	19 months--Jan, 1862-July, 1863	....	2,120	127	5.99	16.7
Confederate forces serving in S. C., Ga. & Fla.; hospital reports	19 months--Jan, 1862-July, 1863	....	1,862	370	19.8	5.03
Confederate forces serving on Gulf of Mexico; mean strength 6,752; field reports	19 months--Jan, 1862-July, 1863	....	1,163	151	12.9	7.7
Confederate Army of the West and Tennessee; mean strength 40,273; field reports	12 months--June, 1862-May, 1863	....	6,974	1,090	15.6	6.4
Confederate Army of the West and Tennessee; hospital reports	12 months	....	2,957	542	18.3	5.4
Empire Hospital, Atlanta, Ga	28 months--March, 1862-Oct, 1864	....	267	73	27.3	3.6
Medical College Hospital, Atlanta, Ga	29 months--Feb, 1862-June, 1864	....	363	129	35.5	2.8
Gate City Hospital, Atlanta, Ga	16 months--March, 1862-Nov, 1863	....	381	51	13.3	7.4
Institute Hospital, Atlanta, Ga	13 months--Sep, 1863-Sep, 1864	....	198	45	22.7	4.4
Fair Ground Hospital No. 1, Atlanta, Ga	24 months--Oct, 1862-Sep, 1864	....	322	114	35.4	2.8
Fair Ground Hospital No. 2, Atlanta, Ga	20 months--Feb, 1863-Sep, 1864	....	324	96	29.6	3.37
Polk Hospital, Rome, Atlanta & Vineville, Ga	12 months--Oct, 1863-Sep, 1864	....	54	11	20.3	4.9
Roy Hospital, Atlanta, Ga	10 months--Jan, 1863-Jan, 1864	....	50	11	22.	4.5
Ocmulgee Hospital, Macon, Ga	9 months--Feb, 1864-Oct, 1864	....	50	6	12.	8.3
Stout Hospital, Macon, Ga	4 months--June, 1864-Sep, 1864	....	10	3	30.	3.33
Blind School Hospital, Macon, Ga	9 months--Jan, 1864-Sep, 1864	....	37	6	16.2	6.1
Floyd House Hospital, Macon, Ga	30 months--April, 1862-Sep, 1864	....	205	47	22.9	4.3

Marine Hospital, Charleston, S. C.	13 months--Jan, 1862-Feb, 1863		25	9	36.0	2.77
Citadel Square Hospital, Charleston, S. C.	10 months--Jan, 1862-March, 1863		67	8	11.9	8.37
Trapman Street Hospital, Charleston, S. C.	16 months--Dec, 1861-March, 1863		50	4	8.00	12.5
General Hospital No. 1, Savannah, Ga.	25 months--Dec, 1861-Jan, 1864		370	116	31.35	3.18
General Hospital No. 2, Savannah, Ga.	June, 1862-Jan, 1864		108	25	23.14	4.32
Guyton Hospital, near Savannah, Ga.	May, 1862-Jan, 1864		78	7	8.98	11.14
General Hospital, Staunton, Va.	44 months--July, 1861-Feb. 1865		833	191	22.9	4.3
General Hospital, Charlottesville, Va.	26 months--July, 1861-Aug, 1863		647	207	31.9	3.12
General Hospital, Charlottesville, Va.	15 months--Sep, 1863-Feb, 1864		187	37	19.7	5.05
General Hospitals in Va., out of Richmond	13 months--Jan, 1862-April, 1863		4,774	1,261	26.41	3.78
General Hospitals in Richmond, Va.	Sep, 1862-April, 1863		1,527	405	26.56	3.76
General Hospitals in Virginia	April, 1863-August, 1863		2,344	576	24.14	4.05
Charity Hospital, Vienna, Dr. Dietl		Dietetic system	189	14	7.46	13.5
Charity Hospital, Vienna, Dr. Skoda	1843--3 years 5 months	Expectant system	392	54	13.77	7.27
Edinburg Royal Infirmary, Dr. Bennett	8 years	Rational treatment	78	3	3.84	26.
Kings College Hospital, Dr. Todd	1847-1859	Antiphlogistic treatment	53	6	11.32	8.83
Hospital la Charite, Louis		Bleeding, Antiphlogistic treatment	78	28	35.85	2.78
Hospital la Petie, Louis		Antiphlogistic bleeding and Tar. Emet.	29	4	13.79	7.25
Hospitals la Charite and la Petie, Louis		Antiphlogistic bleeding and Tar. Emet.	107	32	29.94	3.34
Massachusetts General Hospital, Dr. Jackson	1831-1835	Antiphlogistic bleeding and Tar. Emet.	51	8	15.68	6.37
Royal Infirmary of Edinburg, Dr. Bennett and others	1812-1837	Antiphlogistic bleeding, calomel, etc.	50	19	38.	2.63
Royal Infirmary of Edinburg, Dr. Bennett and others	1839-1849	Antiphlogistic bleeding, calomel, etc.	648	222	34.26	2.91
Kings College Hospital, Dr. Todd	1840-1847	Antiphlogistic bleeding, calomel, etc.	25	4	16.	6.25
Hospitals of Milan, Rasori		Antiphlogistic, Tartar Emetic	832	173	20.79	4.8
Hospitals of Bologna, Tommasini		Antiphlogistic, Tartar Emetic	115	14	12.17	8.21
Clinic of Faculty of Medicine, R. Laennec	1824-1825	Antiphlogistic, Tartar Emetic	62	6	9.67	10.33
Clinic of Faculty of Medicine, R. Laennec		Antiphlogistic bleeding	..	...	....	6 to 8
Dr. Hellis, of Rouen		Antiphlogistic, Tartar Emetic	47	5	10.63	9.4
Hotel Dieu, of Nantes, Dr. A. Laennec	1823-1824	Antiphlogistic, Tartar Emetic	40	6	15.	6.66
Charity Hospital, Dr. Dietl		Antiphlogistic, Tar. Emet. large doses	106	23	20.7	4.818
Charity Hospital, Dr. Dietl		Antiphlogistic bleeding	85	17	20.00	5.
English Army in Crimea	1854-5-6		590	161	27.2	3.6
United States Army, Civil War of 1861-2	1861-July, 1862		11,061	2,134	19.2	5.1

The important fact illustrated by this table, is that the mortality from pneumonia, in a large number of Confederate hospitals (those entered upon the table were selected without any reference to the character of the statistics), was far greater than the mortality in this disease under different modes of treatment in European hospitals.

The mortality in these Confederate hospitals has been twice as great as that under tartar emetic in large doses, and about four times as great as under the dietetic system, in which the powers of nature are simply supported, and drugs abandoned. These facts are surely sufficient to excite an earnest and diligent inquiry into the relative merits of the different modes of treating pneumonia, now in use by Southern physicians.

In the present paper we propose to consider the

Antiperiodic or Abortive Treatment of Pneumonia.—These terms are used, not so much to indicate the true nature of this plan of treatment, as to express the views which have led to its employment by various practitioners in the Southern States.

Southern physicians, have for a number of years, used quinine in the treatment of pneumonia; and previous to the recent civil war, a number of articles have from time to time appeared in the various medical journals, extolling the virtues of quinine in the treatment of this disease, and more especially in malarious regions. By many of the advocates of the power of quinine to greatly modify and even arrest the progress of pneumonia, the doctrine is held that the disease arises from the same causes, is intimately associated with malarial fever, and in fact is nothing more than one of the forms of periodic fever. The remark is not unfrequently heard, that pneumonia should be treated as a malignant remittent. Those who adopt the view of the identity of paroxysmal fever and pneumonia, believe that quinine in full doses, is capable

of arresting the latter, in the same manner that it arrests or aborts the former.

We might bring forth numerous quotations from the older writers, to prove that the belief in the identity of the causes and ultimate nature of pneumonia and paroxysmal fever, as well as the treatment by bark and quinine founded upon this view, are by no means so novel as some of the modern writers, and especially American medical writers, would have us believe. Our limited space, however, will permit only brief references to some of the most trustworthy authorities.

Jean Senac* in his celebrated and unsurpassed treatise on the "Hidden Nature and Treatment of Intermitting and Remitting Fevers," discourses in several chapters upon the conversion of intermittent fever into pleurisy and pneumonia; and in his observations upon the method of detecting or distinguishing intermittents, when disguised under the mask of other diseases, relates a case of intermittent pleurisy, cured by febrifuge remedies. Galeatius, near seventy years ago, in a work on Peruvian bark, pointed out the efficacy of this remedy in the cure of pneumonia occurring in intermtttent fever, and which he considered as one of the manifestations of paroxysmal fever. George Cleghorn, in his "Observations on the Epidemical Diseases of Minorca, from the year 1744 to 1749," describes a fatal form of pneumonia and pleurisy, with distinct remissions. "When those pleurisies," says Cleghorn, "first became epidemical, their quick progress and uncommon mortality surprised me greatly. I attempted to cure them by bleeding, once or twice a day, if the complaints were violent, as I had always used to do in inflammatory fevers; but the remissions in the mornings sometimes induced me to omit the operation; and

*De Recondita Febrium Intermittentium, tum Remittentium Natura et de earum Curatione: Variis experimentis et observationibus illustrata. 1769.

the cessation of the symptoms, which generally happened about the third day, made me imagine that the danger was over; so that before the patients were blooded above two or three times, the exacerbation came on upon the fourth or fifth day, and defeated all attempts by bleeding, blistering, or otherwise to relieve them.

"Those unforeseen events startled me greatly, and led me to review the whole progress of the disease, its symptoms and issue. I had observed that some escaped by means of expectoration and purulent urine, without much assistance from phlebotomy; and considering the periodical revolutions of the fever, the quick transition of the stitches from one part to another, together with the prevailing color of the blood, as well as that of the spitting, and other excretions, I was apprehensive that those were what authors call bilious pleurisies, which they allege are exasperated by large evacuations:* particularly Duretus,† who exclaims with great vehemence against those physicians who trust principally to bleeding in the care of those diseases, without waiting for the natural evacuations." Loc cit. p. 164-5.

Morton appears to have frequently detected the malignant intermittent concealed under the mask of pneumonia and pleurisy. This physician relates, among others, the case of a man who was seized in the morning with a violent shivering, and a pain in the thorax of so severe a character as to render respiration scarcely practicable. The pulse of the patient was small and rapid, his weakness was extreme, and universal coldness overspread all the limbs. Notwithstanding these symptoms, blood-letting from the arm was employed as the necessary and proper remedy for this spasmodic state of the respiration.

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*Ballon. Epid. Sparsim. Bianch Hist. Hep. p. iii. § viii. &c. Bagl. Prax. Med. 1, i. c. ix. Lancis Epid Rom c. vi.

†O homines republicae calamitosos atque funestos! ipsam pleuritidem, quae sua sponte nullius operis indigens cum tali sputo quiesceret, ex eventur reddunt mortiferam. Duret in Praenot. Coac.

When, however, from the nature and return of the paroxysms, Morton detected a fever of a malignant character, masked under the appearance of a peripneumony, he made the bark the principal foundation of his treatment, and succeeded in arresting the disease.

Lautter, as quoted by Alibert, in his treatise on malignant intermittents, has recorded two similar cases in his Hist. Medic. bienn. morb. rural, etc.; Casus v. & ix.

A labourer of Luxembourg, thirty years of age, of a dry temperament, being engaged in threshing corn, was seized, first with a trembling, and then with a violent coldness, to which succeeded a short hot fit, and great thirst. The principal symptom was an excessive pain in the left side, which considerably impeded respiration. Being obliged to quit his work, he took to his bed; the fever continued nearly eighteen hours in the same state, and then underwent a perceptible remission. On the morning of the day following, the patient was still better. Although he was rather feeble, the stitch in his side continued, and he was certainly in some degree feverish, yet he went to work again, but all the symptoms returning toward evening, he again took to his bed. Lautter was called in; he found his patient laboring under a high fever, his pulse was hard, his respiration laborious, painful, and almost suppressed; the pain in the side was extremely acute; there was no cough. From the history of the disease, the physician discovered immediately that it was a malignant intermittent, masked by the predominant symptom of pleurisy; not being able to strike immediately at the root of the disease, because the exacerbation was then at its height, he employed himself in moderating the violence of the symptoms. He drew from the arm of the affected side ten ounces of blood, which was covered with an inflammatory crust, and ordered an emollient cataplasm to be applied to the part

where the pain lay, and to be frequently renewed. Internally he administered barley-water with oxymel and nitre; the patient experienced relief, his respiration became easier, and the pain in his side abated; yet he passed a sleepless night with heat and great thirst. On the day following, his pulse was indeed less frequent, and was not hard, yet he had a high fever; the pain in the side continued, the urine, which was very high colored, deposited a lateritious sediment; the symptoms were now much milder, but as they had not altogether disappeared, the foregoing remedies were continued. In the evening, the disease resumed completely its first state and appearance. On the morning of the following day, there was no remarkable change, except that the acute pain in the right side disappeared for a short time, but soon returned again; the urine had undergone no change since the day before, the skin was constantly cold, etc. Lautter discovered immediately the malignant character of the fever. He took advantage of the remission to administer an ounce of the bark in the space of twenty-four hours; the next paroxysm was a very moderate one; and by continuing the use of the same remedy, the disease was radically cured.

A woman, sixty years of age, having her system greatly heated by exercise, exposed herself imprudently to the coolness of the evening. She was attacked by a cold fit, which was followed by a fever of great intensity. A severe pain occurred in the right side, extending round to the spine; a dry and frequent cough added to its acuteness; the respiration was short and laborious, and the succeeding night was passed without sleep. Lautter was called in; he found the pulse greatly agitated, full and hard, the tongue white and dry. Taking the disease for a pleurisy, he drew blood from the arm of the side affected, and laid an emollient cataplasm on the part

where the pain was situated; the blood was covered with an inflammatory crust. The symptoms became milder.

On the same day, at one o'clock in the afternoon, the shivering returned with a slight degree of coldness; the febrile heat, the cough, the pain, etc., were all augmented; the pulse was as full and as hard as at first; blood was consequently drawn a second time, and exhibited again an inflammatory crust. There was now a remission of the febrile symptoms. On the evening of the day following, the cold fit returned; the pain, the heat, the cough, etc., increased considerably, in consequence of which the patient passed a very bad night.

Next day there was a remission; afternoon, another exacerbation, ushered in by a cold fit. The physician contented himself with repeating the application of cataplasms, and administering cooling drinks. He had no further recourse to blood-letting, because the patient's strength was greatly exhausted, and from the progress of the disease and the copious sediment of the urine, it was easy to discover a double tertian remittent lurking under the mask of pleurisy. Lautter gave an ounce of a mixture of bark to be taken previously to the return of the paroxysm which was very near at hand. During the succeeding night, the patient experienced only a great heat, but the cough and the pain in the side did not increase. On the following day, the same medicine was continued, and there was scarcely even the shadow of an exacerbation. By the continued use of the bark, the patient was very soon restored. (A treatise on malignant intermittents, by J. L. Alibert, translated by Charles Caldwell, M. D.; Philada., 1807: pp.46–50). Alibert in the same connection recounts a similar case of intermittent pneumonia, occurring in a student of medicine in Paris, which was successfully treated by wine and bark.

Laennec observed the existence of intermittent malarial pneumonia (pernicious pneumonic fever) in a muscular, robust man, who had entered the hospital with a recent syphilis. On the sixth day of his admission, the patient suffered with a paroxysm of intermittent fever of considerable violence, and he stated that he had had a paroxysm two days before. A third paroxysm occurred on the third day after, but it was entirely different from the preceding paroxysm; it commenced with a more considerable chill, was accompanied with a violent headache, extreme dyspnœa, and hemoptysis. Upon exploring the chest during the middle of the paroxysm, the respiratory murmur was found unaltered except at the root of the lungs, where it was masked by a *rale crepitant* well characterized, principally on the right side. Laennec, without hesitation, declared the disease a double pneumonia in its initial stage: tartar emetic, six grains; sulphate of quinine, eighteen grains, to be taken in three doses. The patient vomited a little and had but one stool; the next day he thought himself cured. But as the *rale crepitant* had not entirely disappeared with the cessation of the febrile paroxysm, the two prescriptions were continued. The following paroxysm was very short; the *rale crepitant* was slightly developed, and the hemoptysis reappeared; but the fever had scarcely ceased, when all the symptoms disappeared (that is to say, as soon as the disease ceased, it no longer existed). The tartar emetic was discontined on the fifth day, the respiration having become pure and natural; the sulphate of quinine was continued for some days. The patient was now cured of the fever, and the anti-syphilitic treatment, which had been suspended, was resumed. Three weeks after, the intermittent fever reappeared; it was now simple and benign, and a few doses of the sulphate of quinia entirely arrested it; the patient remained six weeks longer in the hospital, and left in

good health. In like manner M. Fleury records a remarkable case of tertian pneumonia, which was attended with almost complete disappearance of the distressing pneumonic symptoms during the intermission of the fever, and which was arrested by quinine and bark. (See Physiological Pyretology; or a Treatise on Fevers, etc., by F. G. Boisseau, trans. by J. R. Knox, M. D.; Phila., 1832; pp. 433–436.)

We might present the testimony of many other writers, as Ramazini, Lancisi, Sydenham, Hunham, Sauvages, and Broussais, to show that the notion of the production of pneumonia, by the same causes which generate the various forms of malarial fever, has been not only long, but widely held by the medical profession; but the authors already cited are believed to be sufficient for the establishment of this proposition.

Without attempting at this time to settle the question as to whom belongs the honor of first giving bark and quinine in pneumonia and inflammations generally, we have shown conclusively that the former remedy has been freely used in the treatment of all fevers and inflammations for at least a century; and as the principles which led to its administration did not differ materially from those which now lead to the use of quinine, and as the bark necessarily included this constituent, if any credit is due to this method of treating inflammations, it rests with the older writers.

We will endeavor in the next place to determine the relations of malarial fever to pneumonia, by the application of those facts and principles which have been developed by our own investigations.

We shall content ourselves with the expression of only those general results of our investigations which bear upon the treatment of pneumonia.

1st. *There is no necessary connection between pneumonia and malarial fever.*

In healthy, elevated non-malarious regions, pneumonia is almost never complicated with malarial fever.

In malarious regions on the other hand, pneumonia is frequently complicated with malarial fever. The local inflammation frequently appears in those who are laboring under the action of the malarial poison, and the disease partakes of the paroxysmal character.

If the system of healthy individuals be reduced in malarious regions, by any depressing agent or disease, as by the amputation of a limb, or by the inflammation of some organ, as of the lung in pneumonia, the malarial poison is most likely to exert its effects. In such cases the paroxysmal character of the inflammatory disease is due not to the pre-existing action of the malarial poison, but to the fact that the system has been so depressed as to be unable to resist the action of the malarial poison.

2. *The malarial poison induces profound alterations in the constituents of the blood.*

Under its action, the colored-blood corpuscles are more rapidly, and to a greater extent, destroyed than in any other disease. The fibrin is diminished and altered in quality. The albumen is in like manner diminished. The extractive and coloring matters of the blood are frequently increased. The unhealthy hue of the complexion in malarial fever, appears to be due to both the destruction of the colored-blood corpuscles and the presence of coloring matters in the blood.

3. *During the active stages of malarial fever, phosphorus and the compounds of phosphorus in the nervous structures and in the colored-blood corpuscles, as well as sulphur and the compounds of sulphur in the muscular structures, undergo more rapid changes than in the normal state, and phosphoric acid and the phosphates, and sulphuric acid and the sulphates, appear in increased quantities in the urine.*

The waste of phosphorus and its compounds in the blood corpuscles and nervous structures during the active stages of the fever, is far greater than the supply of these elements through the food.

The nervous disturbances and debility characteristic of malarial fever are in a measure, if not entirely, due to these rapid changes in the phosphorescent materials of the nervous structures and especially of the central ganglionic cells.

4. *During the slow action of the malarial poison, as well as during the active stages of the paroxysm, important changes take place in the liver and spleen.*

In both organs, the colored-blood corpuscles are destroyed in large numbers, and the coloring matter, resulting from the disintegration of the red corpuscles, accumulates in them, and in conjunction with other changes in the nutritive processes of these organs, produce those characteristic alterations of the normal color. In fatal cases, cellulose is found in both the liver and spleen, whilst grape sugar is absent from the liver. The bile is altered both in chemical constitution and physical properties.

5. *That the chemistry of the body is still farther deranged in malarial fever, is evidenced by the changes in the excretions.*

During the chill, and at the very commencement of the hot stage, phosphoric acid disappears almost entirely from the urine; as the hot stage progresses, and the febrile action and the heat commence to decline, there is an augmentation of phosphoric acid.

But what is still more important in its bearings upon pneumonia, the uric acid is either increased, or remains at the normal standard, during the chill; disappears almost entirely during the fever; and then increases rapidly, and rises to a high figure, after the subsidence of the febrile excitement, and often continues for days, two, three, and even six times more abundant than in the normal state.

If it be true that the presence of a morbific material in the blood, as uric acid, in gout and rheumatism, will often prove an excitant to inflammatory action, this tendency in malarial fever to the generation of large quantities of uric acid during the intermissions, and even during the period of convalescence, is important in its bearings, not only upon pneumonia, but also upon neuralgic affections.

I have in my own case observed changes in the urine, and especially in the uric acid, during severe headaches of malarial origin, similar to those observed in well-defined cases of paroxysmal fever.

6. *One of the most marked and important of the phenomena of malarial fever, in its connection with inflammations of internal organs, is the congestion of important organs at stated intervals.*

It would even appear that, aside from the general depressing effects of the malarial poison upon the heart and circulatory system at stated periods, and the consequent stagnation of the blood in the central portions of the circulatory system, the altered blood corpuscles, and the products of their death and disintegration, as the coloring matter, may under certain conditions obstruct the smaller vessels, and give rise to local and circumscribed congestions and even effusions.

It results from these effects of the malarial poison:

(*a*.) *When inflammation is excited from any cause, in a system subjected to the influence of the malarial poison, the natural tendency is for the inflammation to assume a low form, from the altered condition of the constituents of the blood and structures, and from the derangements in the processes of nutrition, and of those physical and chemical acts by which the nervous and muscular forces are developed.*

It is well known that the causes which are most influential in the production of inflammation are such as enfeeble the heart, impair the tone of the arteries, reduce

the activity of the secreting organs, and debilitate the muscular and nervous forces.

Imperfect nourishment also, either in consequence of the defect in the quantity or quality of the food, or of incapacity of the digestive powers, impairs the powers of the system to resist the effects of deleterious and depressing agents, as cold; and produces a liability to low forms of inflammation and fever, and to various epidemic and contagious disorders.

In malarial fever, even when the digestion is unimpaired, the action of the poison, by impairing the constitution of the blood, and by deranging the nutritive processes of the different organs and tissues, and by deranging and depressing the chemical actions concerned in the development of the physical and nervous forces, produces similar results to those witnessed in ill-fed and ill-conditioned beings.

The process of inflammation, whilst including both congestion and determination of blood, is essentially more complex than either or both of these conditions, and includes changes of the blood within the vessels, and changes of the relations of the capillaries to the blood, and of the blood to the surrounding tissues.

The character of these changes, as well as the extent and progress of the inflammation, will depend upon the constitution of the blood, the forces moving that blood, and the condition of the forces active in the nutrition of all the organs, as well as of the forces especially active in the inflamed tissue. Thus, when the character of the blood has been altered and the forces depressed, the solid products of inflammation are less capable of organization, the lymph effused possesses inferior plasticity, and the effects of the local inflammation upon the general system, in causing inflammatory fever, are more depressing and dangerous. As therefore the tendency of the malarial

poison is to derange the conditions upon which the maintenance of healthy nutrition depends, viz.: the regular supply of healthy blood possessing a definite composition and relation of its elements, and of a certain supply of physical and nervous force, and the healthy constitution of the organs and tissues, it is evident, not only that inflammation engrafted upon the system laboring under the effects, or under the direct action of the poison, must be correspondingly altered from its progress in the healthy constitution, but also that the state of the system induced by the action of the malarial poison is conducive to the origin of inflammation.

(*b.*) *From the destruction of the fibrin and red-blood corpuscles, consequent upon the action of the malarial poison, the tendency of inflammations excited in systems under the influence of the malarial poison is to diffusion.*

The increase of fibrin in the blood, and in the inflamed structures, appears to be destined, in the economy of nature, to limit and circumscribe the inflammatory action, by the fibrinous matter thrown out within and around the inflamed part.

The colored-blood corpuscles, which crowd the inflamed part, appear to contribute by the chemical changes which they excite, and especially by the increased oxidization of the protein elements, to the formation of fibrin, which in this view may be considered as one of the controlling and limiting elements of inflammation. Whatever therefore tends to diminish the red corpuscles and fibrin, tends to interfere with the natural processes employed by nature in the limitation of inflammation, and directly promotes the diffusion of the inflammation over a greater extent of tissue, and in a corresponding degree renders it more severe and dangerous.

We have in these facts an explanation of the sudden and fatal character of many cases of pneumonia occurring

in those who have been for some time under the influence of the malarial poison.

We have had under treatment, and recorded at length elsewhere, cases which were suddenly seized with pneumonia during the period of convalescence from malarial fever. These patients were destroyed, or rather drowned, by the rapid pouring out of serous fluid into the air cells and bronchial tubes of the lungs. In such cases, the capillaries of the blood, being in an enfeebled state, the fibrin of the blood being diminished in quantity and altered in physical and chemical properties, the colored-blood corpuscles, being diminished in number and physically and chemically altered, the solid matters of the blood having been diminished, and the physical and chemical relations between the individual constituents of the blood and capillaries having been disturbed by the action of the malarial poison, *healthy limited inflammation was impossible.*

Diffused inflammation of all the structures of the lung resulted, the serous portion of the blood poured into the air cells, bronchial tubes and trachea; the supplies of oxygen were in a great measure cut off; the chemical changes of the solids and fluids were in a corresponding degree checked; and the physical forces, heat, and electricity, and the nervous force, developed by these chemical changes, were, as a necessary consequence, correspondingly diminished.

Broussais, in his history of chronic phlegmasiæ, has recorded several analogous cases of fatal pleuritic and pulmonic affections attacking those suffering with malarial fever; and Andral, in his "Clinique Medicale," has given at length a fatal case of pneumonia, with pulmonary œdema and double pleuritic effusion following and supervening upon intermittent fever.

(*c.*) *The liability of persons who have suffered with malarial*

fever in the Summer and Fall, to be seized with pneumonia, in the Winter and Spring, and the danger of these inflammatory attacks following or engrafted upon paroxysmal fever, have long been known to the public as well as to the profession.

In many cases, these inflammations engrafted upon malarial fever, or following its effects, are clearly dependent for their excitation upon the vicissitudes of the weather, and especially upon the agency of cold.

In healthy beings exposed to cold, there is at first, through the stimulating effects of the cold air inspired, and of the change of temperature upon the exterior, an increase in the circulating and respiratory actions, more oxygen is introduced and distributed, the chemical changes of the system become more rapid, and the temperature of the body, notwithstanding the increased radiation and loss of heat, is maintained at the normal standard by the increased chemical actions. As long as the fixed normal temperature of health is maintained in the trunk and important organs of animal and vegetable life, no evil results follow. If, however, through the prolonged action of the cold, the materials capable of keeping up the temperature be exhausted, or if the nervous and muscular forces be so depressed that the respiratory and circulating actions are so impaired, that the materials are not distributed with sufficient volume and celerity to maintain the necessary chemical changes to preserve a fixed temperature, the heat of the body gradually descends, not only by progressive conduction and radiation, from the exterior to the centre, as in an inanimated cooling body, but the chilled blood circulating in the vessels of the exterior, and in the capillaries of the lungs, mingles with the mass of blood in the interior, and still farther and more rapidly reduces the temperature of the great central organs. At the same time, the contraction of the vessels distributed through the superficial

structures, under the prolonged action of cold, forces the blood inward toward the largest venous receptacles, and thus induces a state of congestion in the central organs.

It is a well established fact, that a fixed temperature is absolutely necessary to the maintenance of the healthy nutrition of the tissues, to the proper performance of the functions of secretion and excretion, and to the regular and active development of the nervous and muscular forces. Not only by the congestion of the internal organs, but also by the disturbances induced in the chemical and physical processes concerned in secretion and excretion, by the loss of that amount of heat or physical force, which is one of the essential conditions to those actions, do those changes in the mutual relations and constitution of the blood, and capillaries, and organs ensue, which frequently result in the establishment of inflammation. And it is not unreasonable to suppose that, during such disturbances, chemical products may be formed, of a totally different character from those of the healthy organism; just as in the laboratory, with the same organic materials, different products are formed under different degrees of heat; and also, that the excrementitious matters necessarily resulting from the nutrition of the organs and development of the forces may be retained in the blood and structures, from the congestion of the kidneys, and the impairment, if not total cessation of the function of the skin consequent upon the constriction of its pores and vessels, and diminution of its nervous supplies, following the reduction of temperature; and still farther, that these altered products and excrementitious matters may irritate certain organs and excite in them inflammation.

As, therefore, the malarial poison destroys those constituents of the blood and nervous system most intimately associated with, and necessary to, the generation of heat,

and of all the nervous and physical forces; and as it farther depresses the nervous and muscular forces, and the action of the heart, and the tonicity of the arteries, and tends of itself to induce congestions of the internal organs, it is evident that it renders its victims, when exposed to the vicissitudes of weather, and especially to the prolonged action of cold, exceedingly liable to inflammations.

(*d.*) *The action of the malarial poison is attended, not only with derangement in various nutritive processes, but also with the generation of increased quantities of the urates.*

In like manner, in inflammations existing in healthy organizations, when resolution takes place, there is an increased excretion of the urates.

If, therefore, the existence in the blood, and non-elimination of these excrementitious bodies in certain diseases, as gout and rheumatism, tend to excite local inflammations, it is but reasonable to suppose that their non-elimination from any cause, as from the effects of cold, previously described, may, in like manner, tend to excite local inflammations in those suffering from the effects of the malarial poison.

(*e.*) *After the excitation of Pneumonic Inflammation from any cause, the periodic changes, and especially the periodic congestions of the internal organs, induced by the action of the malarial poison, tend to aggravate and increase the inflammation.*

During the cold stage, the blood stagnates, and accumulates in the capillaries of important organs, because the blood has been altered by the malarial poison and the changes which it induces: because the relations between the blood and its containing vessels, especially the capillaries, have been disturbed; because the regular normal chemical changes necessary for the development of the forces which work the machinery are not generated with sufficient energy, or if generated, with even

increased energy, they are not generated in the right position and in the proper quantities, and the correlation of the physical, chemical, nervous and vital forces is thus deranged; because the action of the sympathetic nervous system which accompanies the blood vessels, and regulates the circulation, and respiration, and secretion, and nutrition, and excretion, and relates them to each other, and to the cerebro-spinal system, has been disturbed by the direct and indirect action of the poison, by the direct action of the poison upon the sympathetic and cerebro-spinal nervous systems, or by the relations of the chemical changes induced, or the products generated in the constituents of the blood by the malarial poison, to the sympathetic and cerebro-spinal nervous systems.

From these facts and considerations, we arrive at the following practical conclusions:

First. *Whilst the malarial poison cannot be said directly to produce pneumonia, still it is capable of inducing such changes in the blood, and in the nutritive and excretory processes, as to predispose the system to this and other inflammations.* And therefore,

Secondly. *The physician should never in the treatment of pneumonia, in those who have been exposed to the action of malaria, lose sight of its effects in complicating inflammation of the lungs, and of the consequent necessity of arresting at once, if possible, the farther action of the malarial poison.*

As no remedy can compare with quinine for the accomplishment of this result, its use would in the present state of our knowledge appear to be imperatively demanded in the treatment of pneumonia arising in malarious regions, and presenting well marked and recurrent paroxysms.

This remedy may be indicated even when the patient has exhibited none of the symptoms of malarial fever, before the appearance of the inflammation, for it is well established that the malarial poison may be present in

the system without manifesting any effects sufficient to excite the attention of the physician or patient. Thus, mechanical injuries in those who have been exposed to the action of malaria are frequently attended with the appearance of paroxysmal fever. Whilst the strength was unimpaired, the system resisted the morbid influences of the poison; but when the forces were reduced, by the injury and the consequent inflammation, then the effects of the poison were manifest. In like manner the depressing effects of the pneumonic inflammation may so weaken the forces as to bring the system under the dominion of a poison, which it had before resisted.

Thirdly. *In the treatment of pneumonia in malarious districts, the physician should never forget the similarity, in some important respects, between the effects of the malarial poison and general blood-letting.*

The malarial poison, whatever it be, destroys rapidly the colored-blood corpuscles. Whatever, therefore, diminishes the colored-blood corpuscles, acts in concert with the malarial poison.

General blood-letting more rapidly diminishes these important constituents of the blood, so essential to healthy nutrition, to the maintenance of the nervous and muscular forces, and to the successful progress and resolution of inflammation ; because the colored-blood corpuscles rush along chiefly in the centre of the vessels, and are evacuated more abundantly than the other constituents of the blood.

The malarial poison also reduces rapidly the forces.

General blood-letting reduces rapidly the forces.

The two, in this particular, again act in concert.

We would not, however, deny that circumstances may arise where blood-letting, and especially local blood-letting, would be beneficial in malarial fever, and in pneumonia complicating this disease. Whenever blood-letting

is used, it should be borne in mind that it does not, and cannot, cure malarious disease; its beneficial action is only temporary, and so far from curing the disease, the relief which it has temporarily afforded will vanish, if other remedies, especially the sulphate of quinia, be not used; and as a general rule, without these remedies, the patient will be in a much worse condition than if the blood-letting had not been employed.

In considering the use of general blood-letting in malarial fever, we should ever remember that the cerebral symptoms, the delirium and the torpor of the intellectual faculties, and the congestion of the internal organs, are not inflammatory; they are not due to an exaltation of the functions, or to an irritation of the congested organs, but rather to a loss of power in the circulatory apparatus, heart, arteries, capillaries, and veins, and to disturbances in the physical, chemical, and nervous forces. Hence, therefore, in pneumonia, complicated with malarial fever, we will best guard against those dangerous periodic changes and congestions, not by depleting, but by stimulating and anti-periodic remedies.

Fourthly. *It results from all this, that stimulants and nutritious diet are especially indicated in pneumonia, complicated with paroxysmal fever.*

The nutritious diet supplies the elements of the blood which have been destroyed; and the stimulants not only arouse the depressed nervous system, and through the sympathetic and cerebro-spinal ganglia, excite the circulatory system to a full and salutary action for the introduction and distribution of the elements of nutrition and secretion so necessary to the favorable progress and termination of all inflammations, but they also preserve the elements of the blood and tissues from too rapid chemical change and destruction, by taking their places, and themselves undergoing the chemical changes which are for the

development of the physical forces which work the machinery.

Fifthly. *Quinine may arrest inflammations, or promote their resolution by other modes than its anti-periodic powers, as by its sedative and excretory powers, or by its influence upon the nervous system and capillary and general circulations.*

If the value of this agent in the treatment of inflammation depends upon some such powers other than its anti-periodic effects, then the important result is reached, that this remedy is valuable in non-malarious, as well as in malarious regions.

Upon this question, however, we need definite experiments and investigations.

We hope at some future time to present the results of experiments upon the effects of quinine, both upon the healthy and diseased organism, designed to elucidate those important questions concerning its mode of action.

Finally. *We need, above all things, careful records of the results of the treatment of pneumonia with quinine in full doses.*

As far as my knowledge extends, no well established data exists by which we may determine the relative merits of this agent in the treatment of pneumonia. I have heard experienced and intelligent physicians affirm that, in private practice, when this drug was used energetically in the early stages of the disease, not more than one case in fifty would prove fatal. This is surely an extraordinary result, and far different from the results of the treatment of pneumonia in the Confederate hospitals, which, it must be confessed, as shown by the hospital records themselves, are bad enough; and in fact, no better, and even worse, than the heavy mortality characteristic of the rigid anti-phlogistic method with bleeding, blistering, calomel, and opium, and tartar emetic. The Confederate Surgeons did not use blood-letting to any extent in the treatment of pneumonia, and in many cases

of this disease employed quinine, stimulants, and nutritious diet.

In our own practice, civil and military, we have used quinine freely in the treatment of pneumonia, and especially in those cases which were complicated with malarial fever, and apparently with marked benefit and highly favorable results, but we are inclined to the opinion that a large share of this success was due to two facts, viz: quinine, a comparatively innoxious, and at the same time a tonic medicine, was substituted for the heroic and poisonous drugs so extensively employed in the treatment of pneumonia, and our patients were supplied with nutritious diet, and the strength was supported; in other words, depressing agents were withheld, the strength was supported, and nature was allowed to have her perfect work.

The Confederate statistics demonstrate that but little confidence can be placed in the dogmatic assertions of practitioners, apart from a careful record of cases and the preservation of the actual statistics.

The careful determination of the value of quinine in the treatment of pneumonia, as well as the best mode and period of its administration, as well as the relative action of this agent in malarious and non-malarious regions, should engage the careful attention of Southern physicians.

In the institution of any investigations into the relative value of quinine in the treatment of pneumonia, the following well-established facts are worthy of constant consideration.

Uncomplicated pneumonia, especially in young and vigorous constitutions, almost always gets well, if instead of being lowered, the vital powers are supported, and the excretion of effete products assisted.

From the accounts which have been published concerning the natural progress of pneumonia, it would appear that very slight cases of limited inflammation may be convalescent on the seventh day; that the majority of cases of medium intensity recover between the seventh and fourteenth days, and very severe ones between the fourteenth and twenty-first days.

In the report of the cases, the extent and character of the inflammation, together with the symptoms, progress, complications, and termination of the disease, as well as the exact period of its commencement and the establishment of convalescence, should be noted with scrupulous accuracy.

Without the careful record of these points, the value of such investigations will be greatly impaired.

ARTICLE VIII.

Suggestions made to the Medical Department. Modifications of treatment required in the management of the Confederate Soldier, dependent upon his peculiar moral and physical condition; with a reference to certain points in practice. By F. PEYRE PORCHER, M. D., Surgeon in charge City Hospital, Charleston. Formerly Surgeon in charge of the General (Naval) Hospital, Norfolk Harbor, and the South Carolina Hospital, Petersburg, Va.

[This paper was prepared just before the close of the war, by direction of the Surgeon-General. He is not responsible, however, for the opinions contained in it, as it reached his office at a very late period, and could not be acted upon by that able officer. Though written with a view to impress upon surgeons greater attention to peculiarities which were believed to be characteristic of the soldier of the Confederate army, and which could not be neglected in his treatment without detriment, it is believed that many of the considerations contained in it apply, not only to all those engaged in war, but to others employed in civil practice.

In recalling to the memory some of those sad deficiencies which were as fatally prevalent as they were easily remediable, it affords a warning to those coming after; whilst it gives a medical officer an opportunity to pay a slight tribute to the exceeding heroism of the Southern soldier.]

I wish to make my remarks as brief as possible. I enter upon them with the greatest diffidence; and would most cheerfully commit the task to abler hands—but the conviction is so strong upon me, the results of my own experience strengthened by conversation with a number of surgeons in the army, that I am induced to offer them for the benefit of the junior members in the medical department.

Whatever follows is written for the good of the service, and any personal allusions are disclaimed. The relations of the writer to those he has had the honor to have under his control, or with whom he was officially connected, have very generally given him the greatest satisfaction; and he is enabled to testify to the zeal, fidelity, and ability with which they performed the duties entrusted to them. Differences of opinion, nevertheless, on points connected with therapeutical indications, pathology, or the policy of measures, might sometimes very properly and naturally arise and be discussed with advantage.

There are certain prime fundamental facts connected with the soldier, as he offers himself for treatment, which require to be brought to the attention of the surgeon, in order that he may be thoroughly impressed by them; and that the sick and wounded under his care should continually feel their influence. They are of the very highest importance, and therefore, life or death, recovery or tedious convalescence depend upon their constant observance. That I undertake their presentation and recommend their enforcement, is simply because no one else, at this late date, has come forward to give expression to them.

The success of a medical man, or his want of it, depends upon the doctrines he entertains. His theories, views, abstract ideas even, govern and control his practice. For this we have the authority of the greatest of English philosophers, Lord Bacon, quoted by Mialhe: "Si les

expériences ne sont pas dirigées par la théorie, elles sont avengles; et si la théorie n' est pas sontenue par l' expérience, elle devient trompeuse et incertaine." Not only the selection and administration of medicines, the therapeutical or surgical appliances, but also the general care which he bestows, or sees that others under him bestow, upon the sick, are determined by the opinion which he entertains of their necessity. We must, therefore, endeavor to modify his views respecting the relative importance of certain agents employed by him, if, when carried into practice, the results seem injurious or fatal. I will first invite attention to the secondary rank held by medicines in comparison with other agencies.

Medicines are not the only agents that are successfully used in the cure of the sick—many things besides, a knowledge of which is obtained by observation, reading or experience, under the control of common sense, are also absolutely necessary to their recovery.

The seeing to the proper observance of other general and particular directions are equally as essential as the administration of drugs at stated times. The surgeon, or assistant surgeon, who merely visits his wards, examines his patients, prescribes secundum artem, orders the routine administration, and dismisses the patient and attendant until the usual hour for a repetition of his visit, has only acted the part of a formalist, and he cannot be successful. In the case of those critically ill, there are a great many directions respecting the proper administration of food and stimulants, the maintenance of warmth, avoidance of exposure, improper getting up, etc.; all involved in the comprehensive word, management, that are of the first importance, and need to be pressed most forcibly upon the attention of nurses and wardmasters. These are even more strongly the duty of the surgeon,

because they are likely to receive little regard from subordinates, whose duty it is to carry them out, but who naturally pay little attention to them in comparison to their minds, the vastly more important consideration, of duly administering the medicinal agents. However ward-masters may look to them as supreme and the only effective weapons, the sick cannot get well upon medicines only. They do not cure. They are essential in the cure: for they tend to restore the diseased organs to a condition of health through the purturbative influence in modifying secretions, acting upon glands, producing catharsis, diuresis, diaphoresis, lessening pain and irritability, checking secretions, etc. Thus removing *materies morbi*, urates, phosphates, dropsical accumulations, serum, and other effete substances, the products of digestion, of metamorphosis of tissues, of destruction of proteine compounds, combustion during fever, inflammation, and so forth.

But after all, food is the principal agent which assists in the cure, and its administration in proper quantity and quality is of prime and absolute importance, in comparison with which all other means sink into insignificance. If this is a truism, it has been singularly slighted in our army, and the effects have been disastrous. Recovery in the great majority of cases is brought about through the instrumentality of the digestive organs; by the restoration of the activity of the absorbents, of the venous rodicles of the gastric and mesenteric veins and chyle ducts, the proper sucking up in the digestive track of the "raw material of the blood," which must at all hazards be supplied, and which alone is gifted with the power to restore wasted muscle, blood, brain, nerve substance, adipose tissue—which, in a word, brings the patient back to a state of health. The great object of all our therapeutical efforts in the large proportion of cases occurring

among soldiers is to restore the diseased organs, particularly the intestinal canal and its appendages, to that condition of integrity by which they can absorb and assimilate *food*, recuperate the exhausted and impoverished system, and repair the waste produced during the course of the disease. Even in purely surgical cases the sufferer must ultimately depend solely upon the sustenance afforded by the same set of organs to rehabilitate his frame, and it is through the instrumentality of nourishment alone that the drain produced by excessive suppuration is neutralized. I do not magnify, therefore, the necessity of maintaining them intact and of supplying the pabulum required.

Food *must* be procured and administered, or all other exertions prove futile. It should not be left to the matrons or nurses to parade three times a day, at meal time, to divide out and distribute the customary ration. Those sick a long time with acute or wasting diseases, so common among soldiers, should receive suitable nourishment by an inexorable rule at frequent intervals, day and night, even in small quantities, as the only means of their rapid and effectual recovery. An attention to this point is of greater importance than any other single consideration which belongs to the treatment of the sick soldier.

Let us examine into the principles upon which these views are based, and if correct, let them be urged most strenuously upon the attention of every officer in the service, who is by any possibility likely to disregard them.

What is the most obvious and striking peculiarity of a very large proportion, nearly all, indeed, of our soldiers who are brought into an infirmary or hospital for treatment? *The dominating fact which must impress and modify the whole course of treatment to which any judicious surgeon would subject him, unquestionably is* PROSTRATION. This is

accompanied by weakness, nervous irritability, loss of flesh, the result of bad food, or of food insufficient in quantity, and of unusual privation and exposure to cold, to wet, and to depressing emotions. Chronic diarrhœa has also previously existed, or is present, in almost every case. *Exhaustion*, then, is the great characteristic as well as the essential element to be considered and combatted. In the soldier it may very properly be called chronic—almost every act of his military life has tended to produce it. Its repair must consequently be kept in view by the surgeon at all times, at every moment, and in every procedure which he puts in practice for his relief. Surgeons in the Confederate army will acknowledge this to have been eminently the characteristic feature in the pathological condition of those brought under their care, and yet many of them instituted no modification of treatment based upon this prime fact in their history.

The medical officer of the present day, practicing in the army, who loses sight of this; who is not thoroughly seized and possessed with the idea of unusual prostration and feebleness in the vast proportion of his cases; who disregards the essential previous and present condition of his patient, so markedly adynamic, has committed a grievous error. If adopting exclusively the teaching of any favorite author, he will carry out upon such sufferers the written instruction of works not devoted to the consideration and treatment of the diseases incident to the *soldier*, or which fail to recognize this feature of their condition, he is pursuing a vicious and ruinous system. If his mind is filled with the intention to test all those long lists of prescriptions which he has been in the habit of employing in civil practice—the same sugar of lead and opium, the same infallible calomel, five grains every three hours, the same drastic cathartics, without a moment's attention to the special peculiarity of the man before

him, is most grievously at fault, and his efforts must prove unsuccessful or be attended with disastrous results. The correctness of these cautions, the reality of the principles upon which they are based, and the necessity which exists for their dissemination, has been acknowledged to the writer by nearly every intelligent officer with whom he has conversed.

Of course, individuals differ, and varying degrees of robustness, constitutional vigor, stamina, etc., are found to remain in those coming under the care of the military surgeon; but even in cases apparently most favorable for the use of a depletive, purturbative, or anti-phlogistic course, there should be a reticence with respect to the employment of active medicines. By an almost absolute rule the mildest and least irritating should be selected and used in the smallest quantities; they should be diminished or discontinued as soon as possible, and they should be combined, or neutralized, by those agents, dietetic, medicinal, or regiminal, which support and give tone to the system. Throughout the treatment of almost every case nourishment, however small in quantity, should be introduced at appropriate intervals. Even in controling by medicines whatever amount of inflammation there may be present, we must constantly seek to strike that nice balance, that delicate boundary line, which marks how far we can go and no farther. Here the judgment of the experienced and enlightened physician is capable of its finest displays and is exercised with the best results. Let the surgeon be prone to employ external means as substitutes for internal, to avoid all weakening, depletive treatment, all irritating cathartics; in cases of fever, let him use cold effusions assiduously, mild, cooling, catalytic agents, renal depuratives, salts of potash, chlorate of potash, neutral mixtures, milk, eggs, beef tea, brandy, milk punch, etc. Vegetable astringents, turpentine, etc.,

guarded by opium and demulcents may also be required; neither must he depend solely upon stimulants, and attempt, at the last moment, to save life by them.

In treating ninety-nine soldiers out of every hundred the great object of the surgeon should be to follow Chomel's golden maxim and do him no harm. He must strive to administer the remedial agents that appear to be, and are necessary, in barely sufficient quantities to diminish the existing disease without impairing the integrity of the digestive and assimilatory functions, through the instrumentality of which alone, he knows (if he thinks at all), that he must depend for the subsequent restoration of the patient. He must remember that the subject is not a hearty countryman, recently let loose from "fresh fields and pastures new," with rich and florid blood, and actually suffering from an overabundance of *phlogiston*, but on the contrary, that he is precisely in the opposite condition. He has been reduced by all the usual privations of the soldier's life. These are aggravated by circumstances in the case of the Confederate soldier, which are almost peculiar to him, namely: want, exposure, its attendant depression, and toil, oftentimes prolonged to a degree from which he has finally succumbed through sheer breaking down of the powers of life. If he must be physiced, let it be done most tenderly and charily.

Let his remaining vital forces be husbanded by every means in the power of the attendant. It is more important that he be builded up, strengthened, and sustained at every convenient opportunity by stimulants and nourishment. These should be secured by every personal exertion of the surgeon in charge, and his efforts should be directed to this all-important subject. He should never content himself simply with making the usual monthly requisition for *medicines*, but should devote every energy to procuring what is so obviously of equal, if not

far greater importance, namely: the proper supplies of those articles of food, upon the judicious and timely administration of which those under his care depend more than upon any other means at his disposal. He must send out agents; if need be, appeal to the ready or reluctant patriotism of the rich—buy, borrow, or beg—but they must be had. Those who take the trouble, generally succeed in obtaining what they wish.

If the sugeon is willing to content himself simply with conforming to the Regulations, paragraph so and so, he may neglect all this; he may pass for an excellent officer and may please all in authority over him who cannot look into the daily operations of his charge: for he can hand in at the end of every quarter the usual prescribed bill of mortality, nicely drawn out by his clerk on clean sheets of ruled paper—but he will still be far from performing his duty to his country or to his fellow-soldier. The chief weight of his responsibility does not lie with the medical department, the general regulations of which are important to any well-ordered establishment, but it lies with the great cause we are sustaining. A sacred and heavy responsibility is in his own bosom toward the sick themselves. Their span of life, as far as human efforts go, is in his hands; their parents, relatives, and friends look to the surgeon, that under the direction of an ably-managed and most admirably-conducted administration, he also uses every energy, devotes his whole soul to cary out his part of the duty he owes to those entrusted to his care. To the sick soldier he stands in loco parentis. If he has not entered con amore upon his labors; if, whilst looking after a thousand personal interests, present or prospective, he is lax, indifferent, and willing simply to save himself by only obeying orders and shunning mere military responsibility, he can get through very easily and seem to be a model officer. Through a careless or ignorant

disregard of the things most essential to success, the object and sole aim of his assignment to his post is entirely lost sight of, which is: saving life, if possible, by every exertion, and the returning to duty, in the shortest possible time, tuto, cito, et jucunde, those temporarily under his control. Our hospitals and infimaries, in a provisional army constituted as ours is for an emergency, are not military hospitals in every sense of the term, to be controlled only by the stern rules of war; nor are surgeons enfants terribles, whose chief duty is to hold themselves unapproachable and aloof, in a cold and forbidden isolation, jealous of position, and hedged off by rank from the ignobile vulgus of the *sick*. Our cause is sacred; the common impulse is patriotism; our patients are our brethren, generally from the front, often with equal social position. They are temporarily inferior in military rank, only on account of the superior medical education of the surgeon, who needs only to restrain them within the bounds that military subordination, orders, and discipline have made advisable. The humblest private may be the true hero, worthy of our tenderest care, and all the kindness we can bestow upon him. In attending upon the sick or wounded, no office can be too servile, or degrade him that performs it.

We do not lose either in dignity, position or influence by being always accessible at the proper time. It is a painful spectacle to the humane surgeon to witness the fear, almost approaching to servility, with which a sick man, scarred by bullets, hesitates for days to approach the medical officer, who should be his friend and counsellor. Nor should we allow wardmasters, or other attacheés, to lord it unnecessarily over those who are in a great many cases their superiors in every qualification which distinguishes a man, a gentleman, or a soldier.

Some men seem rather to delight in human misery, so

that it be military; and care not to smooth a path which is rough enough at best. Others are advocates for the enjoyment by every one of the greatest degree of happiness and comfort which is compatible with the general welfare. The Confederate surgeon should always place himself in the latter class, and whilst shunning too great familiarity or intimacy with subordinates, which generally leads to bad results, he should endeavor to make his hospital or infirmary a well-ordered asylum for the weary, the wounded, and the sick. Every privilege or kindness not conflicting with proper discipline and a safe return to duty should be extended to its inmates, with the studious avoidance of everything like a multiplicity of petty or worrying regulations, calculated only to distress or harrass those who have enough hardship to endure, whilst enjoying comparative health amid the dangers of the field. When a soldier becomes justly entitled to the privileges of a hospital, there should be a truce to all suffering save what is inevitable.

The ambition of superior cleanliness, whether it be a permanent or a spasmodic feeling, should not be pushed to extremes, and be considered the one thing needful in a hospital, lest it blind the eye to the absence of other things which are more important. The possession of the neatest and cleanest wards may co-exist with radical defects of the gravest character for outweighing the quality of mere cleanliness, which is very excellent.

All excessive medication, drastic purgatives, compound cathartic pills, calomel in large doses or long continued, should as a general rule be particularly avoided. Perseverance in medication, save that of the mildest character, should be eschewed. Even the pure medicine expectante system, which has been wittily styled a "meditation on death," is better than the old heroic one in a very large

majority of cases, marked as they are by the debility which I have described as the prominent characteristic. Having devoted many years to studying and teaching Therapeutics, the writer is far from uniting with the nil admirari school; he does not agree with either Forbes, Holmes or Bigelow, or with those who consider it a mark of superiority to deride all medical treatment as nugatory or mere guess-work. He firmly believes in the great value and essential importance of judicious and correct medication; and is of the opinion that Mialhe, Trousseau, Headland, Billings, Wood and Stillé, may be consulted with profit both by students and practitioners of medicine. To hold the doctrine, professed by some, but only in theory, that medicines are not beneficial, or that they do not either cure, or aid in the cure, is idle and not worthy of discussion—particularly before those who continue to order them so freely. Every case is susceptible of good or bad management, and there is a vast difference between the two.*

I repeat, that though medicines are essential and necessary, still they are not the only things necessary. In using them, especially upon such subjects as those with whom we are at present concerned, the doses should be far less in quantity than are, I fear, usually prescribed; nor should they be had recourse to so continually.

In giving calomel, for example, in alterative doses, $\frac{1}{6}$, $\frac{1}{4}$ or $\frac{1}{2}$ a grain, with $\frac{1}{6}$, $\frac{1}{4}$ or $\frac{1}{2}$ of ippecacuanha, Dover's powder, or opium, three or four times, is amply sufficient

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*M. Chomel, in his Elemens de Pathologie Generale, Troiseme Edition, p. 582, Paris, article "Therapeutique," gives a most concise decision as to the effects of treatment. I commend it to those loose talkers of both extremes, generally men of a speculative turn of mind, and often without practical experience, who either decry or exalt the action of Therapeutical means:

Nous voulons dire seulement que nos moyens therapeutique n'out pas une action *directe* contre la maladie, qu'ils n'agissent qu'en determinant dans l'economie des modifications en vertue desquelles s'opere le changement favorable qui prepare et acheve la guerison; l'extraction des corps etrangers et la reduction des parties deplacees fout presque seules exception. En exposant cette doctrine, generalement admise aujourd'hui, nous n'enlevous rien a l'importance de la therapeutique, et vous rendous a la nature ce qui lui appartient: egalement elorgnes de ceux qui donnent exclusivement l'honneur de la guerison, soit a l'art, soit a la nature, nous croyous que la concours de l'un et de l'autre et toujours utile et souvent indispensable.

for all purposes. The surgeon has to be particularly careful how he saturates such systems with mercury, or prolongs its use even in the minute quantities which the writer has found abundantly sufficient. The Surgeon-General of the U. S. Army probably did much more good than harm when he entirely prohibited the use of calomel.

Dr. Law's statement, that one grain of calomel in twenty-four powders, given at sufficient intervals, will produce as full or a greater effect than a larger quantity not so minutely divided, and frequently administered, is important, as it affords a practical deduction. For, as Mialhe describes its action, "Chimie appliquée à la Physiologie et à la Thérapeutique," it is through the instrumentality of the alcaline chlorides that mercury gains admission into the system, and only a proportionate amount is in a given period dissolved and absorbed. This change is for the most part effected in the liver.

Besides the great tendency to gastric irritability in many soldiers, the previous existence of chronic irritation of the stomach and gastro-intestinal mucus membrane renders an attention to this point respecting the quantity used especially important, as it allows the surgeon the earlier to retrieve the disastrous effects which so frequently follow large doses of the drug.

My hospital experience alone of ten years has convinced me that, however valuable, essential indeed, the occasional use of mercury may be—particularly when guarded by small quantities of opium or Dover's powder—with the simultaneous administration of alcoholic stimulants, yet when prolonged, even in small doses, it is to the mercury we may justly ascribe the diarrhœa and wasting discharges which very often carry off the patient. The persistent use of calomel is very frequently the direct and only cause of the irritation of the mucus

membranes marked by the "running off" at the bowels. The insidious and fatal colliquative diarrhœas supervening in pneumonias, fevers, etc., are often the sole work of the inordinate and prolonged drugging. They are never beneficial; they diminish rather than promote the activity of the absorbents; cause the surgeon to lose time in the effort to arrest the discharges; and give rise to the worst inconveniences, even where they fail to turn the scale in the wrong direction.

I am not indulging in special pleading, or in the slightest degree pushing the advice to extremes, when I unite my voice with others in urging the whole corps of army surgeons who have not done so to test the use of mercury in doses of one sixth to one half a grain. Let the latter be the maximum amount when used for the alterative effect, as in cases of peritonitis, pleuritis, uretis, hepotigation in pneumonia, and other similar conditions. Two grains is far too large a quantity to be repeated every two or three hours for days, as it is not only injurious but useless. The minimum doses when carried to excess can be recovered from more readily by being sooner eliminated from the system through the aid of laxatives, the oxygen-bearing bodies, chlorate of potash or other catalytic agents. I doubt extremely whether calomel in ten-grain doses is ever borne by the Confederate soldier. Its repetition in this quantity is scarcely ever admissible, unless in an occasional case of obstinate engorgement of the liver or violent constipation occurring in a robust subject.

Let the idea be for ever exploded, especially in our military hospitals and infirmaries, peopled as they are, that each sick man is of necessity to have one or two "bilious" evacuations each day—or he must be dosed until he does. Such rules are bad enough even in the rural districts and among highly-nourished civilians. The

ordering calomel indiscriminately and upon every occasion for its supposed general applicability is simply atrocious.

If ptyalism is ever advisable, and it sometimes cannot be avoided, let it be only the very slightest mercurial effect, and not carried so far as to produce salivation. They remind one of the comparison instituted by the Jewish women between Solomon and David; the execution of each is great enough, though one may have only slain its thousands.

I append an extract which I had quoted from Stillé's Therapeutics, v. ii., in my Prize Essay, published by the South Carolina Medical Association in 1861.* Dr. Morehead's description should be written in letters of gold. I endorse in full the doctrine it conveys, and believe their adoption in practice would be a great boon conferred by the practitioner of medicine upon the people. It was only confirmed by my own previously-acquired experience during six years service before the war, in charge of the Marine Hospital, Charleston, in the General Hospital at Norfolk, and the S. C. Hospital, Petersburg, Va.:

"The cholagogue action of mercury is invoked in this affection to relieve the overloaded liver, as it is in yellow fever to stimulate the non-secreting liver. Leaving unattempted here the task of reconciling these apparent contradictions, let us endeavor to learn whether or not experience has proved mercurials to be useful in bilious remittent fevers. In reference to their *purgative* action, it may be remarked that this is generally sought for at the beginning of an attack, by the administration of ten grains of calomel at bed-time, and some saline laxative, or else jalap, on the following morning. But even at

*Illustrations of Disease with the Microscope.—Clinical Investigations aided by the Microscope and by Chemical reagents, with Microscopical observations of Pathological specimens, Medical and Surgical, obtained in Charleston, S. C., with upward of 500 original drawings, made from nature *Natura maxime miranda in minimis*—Linnæus. Charleston, S. C., C. S. A.

this stage such treatment is unnecessary, unless the abdomen is full and hard, the tongue much coated, and the alonic evacuations sensibly disordered. In this disease the real remedy is quinia, and it is much better to obtain its specific operation as soon as possible, feeling assured that then the associated local derangements will be all the more readily removed.

"It may be presumed that the employment of calomel as a constitutional remedy in this disease, whether by the daily repetition of slightly laxative doses, or the more frequent administration of still smaller quantities, is still the general practice in some portions of the United States.* So far as these forms of the disease are concerned which originate in the Middle States of the Union, we have never found it necessary to prescribe mercurials except as purgatives, relying for the cure of the disease upon quinia alone. It is possible that the more inflammatory form of remittent fever met with in Southern latitudes may call for a different management. [My own experience has convinced me that it does not. It should not be selected, even as a purgative in the case of the Confederate soldier.] But the excellent reports of Dr. Bolling, and several other Southern physicians, render this supposition improbable. Moreover, if we turn to the East Indies, whence the calomel treatment first emanated, we shall find that it no longer holds its original place in the medical creed of that country. One of the most eminent of the East Indian practitioners, Dr. Charles Morehead, says:† 'The practice, at one time too common, of exhibiting calomel in doses of four or five grains three or four times in the course of the day, without any very definite object in view, and continuing it for a succession of days, cannot be too strongly discouraged.

*Compare Bolling, on rem. fever. Am. I. Med. S. C., July, 1846, p. 29, and Dickson's Elems. of Medicine, p. 243.

†Clinical Researches on Diseases in India, i., pp. 202-206.

Not only is it unnecessary, but for the following reasons, often positively injurious. In watching the progress of cases thus treated, it is not difficult to detect a train of symptoms much more fairly attributable to the treatment than to the disease, because it is in cases thus treated that this has been chiefly observed. The symptoms to which I allude are uneasy feeling, sometimes amounting to pain, with a sense of oppression or sinking at the epigastrium, and occasionally griping of the abdomen, for which leeches are not unfrequently applied, and purgatives unnecessarily given. The frequent repetition of the calomel keeps up also a foul state of the tongue, nausea and irritability of stomach, aggravates the febrile excitement, and produces an irritable state of the bowels, marked by frequent watery discharges. The convalescence of cases thus treated is always tedious, and frequently complicated with diarrhœa and clay-colored dejections.' 'I am of opinion that an endeavor to induce mercurial influence in remittent fever is erroneous in theory, and of no value in practice;' not only so, but 'it is opposed to all rational theory, and very injurious in practice. If it be true that prostration of vital actions and a deteriorated condition of the blood are pathological states to be much dreaded in remittent fever, and if mercury deteriorates the blood and favors prostration, on what principle of reasoning can it be supposed that induced mercurial influence can have any other than an injurious effect on remittent fever?' The author further attributes to the mercurial treatment so long prevalent in that country, the frequent occurrence of a cachexia marked by asthma, dyspepsia, injured teeth, pains in the side and loins, foul tongue, constipation, pale faces, and depressed spirits."

From my experience in the Marine Hospital, where a large number of the worst forms of malarial fever were treated, with a very large proportion of recoveries (see

report in detail, Charleston *Medical Journal*), I ascertained that, with the exception of an occasional dose, mercury could be dispensed with. A few grains were given at the inception of some cases, and occasionally, in combination with a little Dover's powder, was administered at night to others in whom there was not much prostration. Few or none of the cases of bilious remittent fever, even of the severest grade, require more than ten grains during the whole course of the attack.

There is no objection to using two grains of calomel with two or three of Dover's powder occasionally, in cases of typhoid fever or typhoid pneumonia with dry tongue; and it has an excellent effect when given simultaneously with brandy or turpentine, one or both, and chlorate of potash water as a drink. These, with nourishment and revulsives (and cupping and poultices if the case demands them) are pretty much all that are required, where we conclude not to treat the diseases with veratrum viride. By giving mercury thus, in combination with Dover's powder at distant intervals when necessary, we avoid its injurious effects. The stimulant will be found still farther to neutralize and counteract any ill effects of the medicine, besides being itself specially serviceable in improving digestion and preventing depression of the nervous centres. This employment of stimulants simultaneously with mercury I have found an important point in practice.

I have also seen excellent results recently from a combination of Dover's powder, three or four grains with three of antimonial powder and one half of calomel, as an alterative, expectorant, and diaphoretic in pneumonia and to prevent the approach of hepatization of the lungs.

Turpentine also, which is so extensively used, need never be given in doses larger than five to ten drops repeated. It will sufficiently stimulate the intestinal

mucous membranes in this quantity; and with an occasional mercurial and wine or brandy, will produce all we expect of it in acting upon the mucus surfaces, in preventing depression of the nervous centres indicated by dry tongue, delirium, etc.

I have established three or four rules which, in my opinion, may be regarded as general principles in medicine, which I will state before passing to other matters:

1st. The natural tendency of disease is to recovery in all fair cases when judiciously treated, not improperly interfered with, and suitably nourished and supplied—the hygeinic conditions being also favorable. Bad treatment, with defective management, will destroy even these.

2d. When the tongue continues dry, alcoholic stimulants can and must be used repeatedly and freely till it becomes moist, because it indicates want of glandular and secretory action, caused by depression of the nervous centres. The quick pulse is simply owing to the altered condition of the blood and the defective innervation, and stimulants are not contra-indicated. To administer purgatives or mercury merely because the tongue continues furred, is ruinous.

3d. At the inception, or even in advance of delirium, apply blisters to the back of the neck and upper portion of the spinal column. The stimulants may also be continued.

4th. Alkalies are serviceable in the inceptive and early stages of disease; acids after the inflammatory symptoms are subdued and the climax is passed—or during the decline of the disease following the protracted use of depletive and active medicines. Acids with tonics are universally applicable when the stage of excitement has been subdued by active medication, and there is relaxation, weakness and prostration, and excessive drain from any cause.

I would also inculcate upon the junior members of the profession (as the result of my own experience repeatedly acquired from experiments made with a view to testing the question of its safety) that, when pushing any course of treatment—but particularly one whose possible tendency is to produce irritation or diarrhœa—it is best to check the treatment, or to desist from it, even before its full beneficial results appear to ensue. Let them invariably err on the side of abstinence, and thus give nature time to operate—her own most excelling handiwork. They will seldom, if ever, regret the "hands off" system.

It has often happened to the writer whilst carrying out a cautious, non-purturbative course of treatment, as above indicated, to question the policy of prolonging it—to fear that the diseased condition, a hepatization of the lung for example, would be re-established, or an inflammation be relit for want of more active measures. I have always found that a favorable result followed the cessation of treatment at the earliest possible moment—earlier than many would have supposed judicious, particularly when aided by external revulsives, demulcents, salines, sponging with cold water, etc.

Merely to extol the recuperative powers of Nature and satisfy ourselves with the trite quotation "vis medicatrix," etc., is useless. Let us do what is better: believe in her practically, give her a fair chance to assist in the cure before organic changes have taken place, and the powers of life are fatally compromised.

Among the general suggestions that I would respectfully offer, are the following:

If to superior judgment, skill and experience possessed by one physician over another, there be added one *habit* to be cultivated for its real practical effect in promoting recovery, it is that of encouraging the sick. Let it be no idle mannerism put on or assumed for effect. It is a

"third estate" in physic, and is next in importance only to food and medicines. It is absolutely potent in its plain, positive results, for the sick man, in his weakened state with his nerves unstrung, is a prey to his diseased imaginations, and depression of spirits greatly diminishes the recuperative energies of the entire organism. He has the "mens insana, in corpore insano." The fancy prone to despondency, and inclined to look at the dark side of things, has dethroned the judgment; and it is the business of the surgeon to reinstate hope and cheerfulness in his heart, on account of the influences which he knows they have upon the vital functions, the secretions, the appetite, and consequently the power with which he responds to remedial agents. By a pious fraud, if necessary, he should conceal from his patient all useless knowledge respecting his pulse, tongue, amount of fever, criticalness of condition, so long as the concealment will tend to lift him out of his state of gloom, despondency, or apathy, and will inspire him with anticipations of recovery. The beneficial effects of instilling cheerfulness and hopefulness cannot be overestimated, and the sufferer should never be left without some encouraging word. We have all witnessed the sudden and extraordinary revolution produced, even in the desperately sick or wounded, by the anticipation of a furlough and the hope of revisiting their homes. Revived hope, as with the wand of an Enchanter, kindles new life in the worn-out frame.

From the brief and imperfect description I gave of the depressing and exhausting effects produced by the circumstances which surround the Confederate soldier, this course of conduct becomes of the first importance in reference to him.

The "Pathology of Shakespeare," as the learned, comprehensive and elegant Watson has called it, when he

speaks of "rasing out the written troubles of the brain," and "ministering to the mind diseased," may therefore be observed by the surgeon with the greatest advantage. Superadded to the prostration and general asthenic state which I have asserted to be the dominant feature of our sick soldiers, there is also very generally extreme apathy as to results, however sombre may be their complexion, or even fatal to their hopes, wishes, or lives.

The Confederate soldier resigns himself to his fate. Once that it is decided that a return home is impossible for him, and he must remain in hospital, the physiognomy of his condition is admirably expressed by the Italian phrase poco curante, which he carries in every feature of his face, in his gait, and in his bearing. He really seems to present the unusual spectacle of a man devoid of either hopes or aspirations; or if he has them, they are suppressed. When he entered the service, whether from compulsion, or, as in nearly every instance, urged by a noble patriotism, his mind was prepared for any fate; the scenes of danger, also, through which he has passed have strung his nerves to so high a pitch of tension —so much higher than mere sickness, which is far below the battle-field in the stirring intensity or the elevation of the emotions it excites—that he is not impressed by his present peril, however imminent may be the fate which it threatens. He is therefore languid, careless and indifferent, and his mind needs to be aroused and stimulated.

There is no one so uncomplaining as the Confederate soldier. Every surgeon who has seen active service will confirm the truthfulness and accuracy of a picture drawn without exaggeration. In your daily rounds to offer him relief he gazes upon you, but does not complain that you pass him by, asks for nothing, does not bemoan his fate, nor murmur at the insufficiency of either food or attendance. He may lie sick under a broiling sun, in a heated

tent, or wounded; he may languish in a hospital, amid the dying and the dead, surrounded by everything to appal even well men:

> "Ubique luctus, ubique pavor
> Et plurima mortis imago."

Yet the mere stripling possesses his soul unterrified, and utters neither cry nor groan. There has always been a courage, and a resolution mingled with his apparent indifference, which has extorted my admiration, and has compelled me involuntarily to recall the noble description of the invincible Cato, whose unsubdued spirit soared aloft when the world crumbled at his feet:

> "Omne terrarum subacta,
> Preter atrocem animum catonis."

In this display of his courage, there is an inexorable sternness almost amounting to atrocity.

When the soldier, leaving friends, kindred and home, delivers up his life for his country, he has paid the dearest tribute that man can offer, and there is a moral sublimity in the act which ennobles the very poorest. In every age the sacrifice has been immortalized in verse and song, and the divine Dante says of him:

> "He goes in quest of Liberty—which is so costly—
> As he knows best who suffered default of life for it."*

I have always thought that the Roman maxim *obstá principiis*, expressed very finely the proper policy to be pursued by the physician and surgeon in the treatment of diseases or surgical injuries. Among the practical suggestions of a general nature, I wish to give prominence to it, as embodying a useful principle: for many surgeons lose time and worry themselves, or become discouraged, because they fail to manage successfully those who are beyond the reach of art. Early treatment should be

* "Liberta va cercando, ch'e si cara,
Come sa chi per lei vita rifiuta."—Purgatorio, i., p. 71.

regarded as almost a *sine qua non* to success. In other words, lose no time at the beginning of diseases, or as soon as they are presented for treatment. Then you can arrest more easily and completely the spread of symptoms; for the danger of organic changes, of blood-poisoning, of passive congestions, of secondary accumulations, of depression of the nervous centres with its results, increase in a geometrical ratio the longer they are permitted to remain unchecked. The surgeon should never permit a hot, burning fever to continue, if it be possible to prevent it by remedial agents, sedatives, cooling applications, etc., for when the passive congestion, coma, or delirium follows, it is too late. Let it be remembered that medicines are far more potent in preventing or arresting diseased states than in curing them when fully developed, and it is especially difficult to do away with the ill-effects of the secondary results of disease. After surgical injuries, use cold water at the beginning and continue it *uninteruptedly*, and do not wait till the inflammation has run too high, or an hour even is lost. Do not strive so much to recover a patient after an engorgement or a hepatization of the lung as to prevent them. Anticipate these changes by energetic means employed at the beginning. It is an easy matter to check the cholerine ushering in an attack of Asiatic cholera, but very hard to arrest the disease after it is fully declared; and this is true with respect to almost every ailment to which the human frame is liable.

In diphtheria, which is a blood disease with the characteristic ashen appearance of the throat, fauces and nasal passages, it is necessary to *begin* the treatment with muriated tincture of iron, chlorate of potash, local applications, soft-boiled eggs, or other light and nutritious food, brandy, etc., at the very earliest possible moment. A few hours delay will make all the difference as to the final

result. Recent contributors speak of cerebro-spinal meningetis as a disease which is inevitably fatal. The only hope will, in my opinion, be found in full blood-letting at the very inception of the disease, when the *malaise* is exhibited. This, with blisters to the neck and spine, cold affusion to the scalp, veratrum viride, and possibly mercury, in small doses repeated, may, if used early, arrest and prevent the secondary blood charges by lowering the inflammatory action. Surgeon Miller informs me that he has thus employed blood-letting successfully. Nearly all recent writers recommend quinine and opium.

After surgical injuries, cold water by irrigation, or *continuously* applied, should not be delayed an hour after any danger from the shock is over. It must be applied thoroughly or not at all. In a large hospital with a number of wounded, I have used dried gourds or squashes to hold the water; they have not a very scientific appearance, but they are light and easily suspended, and they can be refilled without trouble. Empty tin cans will also be found very convenient.

A course of treatment which has been found to be generally successful when employed at the inception of a disease, should not be abandoned by the surgeon because it fails to relieve those who are beyond the reach of assistance from any remedies. Watch the patient closely when he enters, and before he becomes too sick; and give explicit and full directions, with a view to prevent the morbid changes that the surgeon knows are those that will ensue. This is all resolved into the common household maxim: that an ounce of prevention is worth a pound of cure.

If the case is plainly one in which fatal organic changes may have already occurred, do not attempt to combat them by active medicines. The only hope is in the mildest alteratives (and these are of doubtful utility),

rather trusting to the powers of nature, aided by the use of the oxygen-bearing bodies, stimulants and revulsives. Tartar emetic, calomel, etc., are not only ineffectual, but they tend to impair whatever recuperative force still remains. All terrific exertions over the concluding scenes (attended by a great waste of whiskey) are out of place, though very common.

There should be much more attention paid by the surgeons, with such rich opportunities open to them, to perfecting themselves in the art of auscultation and percussion, as well as in the examinations of the renal secretions, in order to assist in the more rapid and accurate diagnosis of some of the most important and numerous cases that come before them. The study and practice of auscultation is to them more than ever a necessity.

It would be well, perhaps, that those known to be skilled in it should be distributed as consulting surgeons wherever soldiers are collected in any number, with authority to aid by daily visits those who stand in need of assistance. One specially qualified by his knowledge of auscultation, or any other branch of diagnosis, should if possible be a member of every Examining Board; and to this extent in their formation the military rule regarding mere rank, age, or date of commission should be violated. It is useless to say that it is expected or assumed that all surgeons should be skilled in every branch of physic, and competent to the performance of every duty required at their hands.

It is well known that surgeons practice for the most part, so far as reading is concerned, upon the capital stock acquired before the commencement of the war. The remark is not made in a derogatory spirit, for the excitement, change to which they are subjected, want of books, etc., are natural reasons why any prolonged application to study is rather the exception than the rule. Many of

the most competent men, whether by reason of age, experience or attainments, were assigned to duty or accepted seats in high cathedral places, on boards, as medical directors, inspectors, purveyors, etc., instead of being placed in active service, where their practical and previously acquired knowledge, or their manual dexterity as surgeons, might have at once contributed to save the lives of thousands who have been treated by the junior and more inexperienced members.

But a transposition is fast being effected: for the juniors in years, from being always in the front, in the field, in the hospitals, or in some position of active responsibility, have become the seniors by the practical experience and the skill which they have acquired.

Every surgeon or assistant surgeon, who is competent, should make it his business to examine each patient at least once attentively and *thoroughly*. This should involve his previous history and the separate interrogation of every prominent organ implicated in the diseased condition. No pains should be spared, for though in the end we may only attain to an approximation to a knowledge of the pathological states, yet this is far better than mere guess work. By the use of all the means at our disposal, through the instrumentality of the superior implements of diagnosis, including the microscope, chemical reagents, etc., greater acuracy is secured than by a mere casual inspection. Superficial or hurried examinations lead to erronious conclusions, and the omission to perform them properly is an act of injustice to the sick. Let every one witness the difference between a complete and thorough examination by an expert, and the careless, hurried, superficial observation of one ignorant of his business, and the proof of its importance will be too convincing to be denied.

For this reason, assistant surgeons should not hurry

through their work. They should esteem their position a privilege, and be glad to avail themselves of the opportunity for instruction, if not for the benefit of the sick, at least for their own improvement. They are rewarded for their services, and no private reasons or motives of self ease should deter them from a full and faithful attention to them without haste, which is inexcusable. They should devote themselves specially to the very sick, and not be cotented with two or three visits a day, as if this was a matter of rule, or as if they were members of a "square and compass club."

It has frequently struck the writer that everywhere in the army the claims of relationship, or private friendship, should be more studiously ignored. In a military service, where all should equally endure the privations and sufferings incident to a war for independence and for national life, there should be no preferences, no partialities of any kind, based on previous personal connections, extended to one individual over another, whatever may be his rank, title, or patronage. Every hardship should be equally endured; no greater favor should be granted to the most influential than to the humblest private soldier. They should stand upon precisely the same footing in any decision that is made respecting them.

With the power of exempting the sick from duty, allowing him to remain in private quarters and granting him a thousand privileges and advantages, the surgeon should always endeavor to exercise the right with a strict view to general equity founded solely upon the merits of each case. No influences whatever, save these, should control his actions. These principles are so closely allied with integrity and true patriotism that the caution might, with propriety, be dispensed with; but personal claims are sometimes so hard to resist, and the practice of yielding to them is so injurious to the general welfare,

that the writer need not claim indulgence for even alluding to the necessity for their being rigidly observed.

Before closing this portion of my remarks, I beg leave to make one observation to those officers who hold supplies in their hands, and upon whom the surgeon mainly depends for furnishing and supporting the sick.

Quartermasters, commissaries, medical purveyors, medical directors, senior surgeons of posts, surgeons themselves, and I may add, paymasters, should remember that the chief virtue does not consist so much in the collection and hoarding of the greatest amount of stores as in their proper, prompt, and equitable distribution, under suitable restrictions, to those who require them. And yet how few approached "the height of this great argument." They cling to their stores as if they were a part of themselves, carefully preserve them at points remote from battle-fields or beleaguered cities, and will rather see them burned than used. There is no virtue in mere storage, per se. The virtue consists in its judicious distribution, for such is the only object of the accumulation. The sick and wounded sometimes perish for want of articles within their reach which are simply hoarded. This is done from a failure to appreciate the true philosophy of the matter, coupled with a certain amount of indifference and "circumlocution." The supplies are so difficult to get at that for all practical purposes they may as well not exist. It "goes without saying," however, that some collection is necessary, or else there would be nothing to distribute.

For stewards, matrons, attendants, and others in hospitals to pamper and indulge themselves in waste and high living, while those in the trenches have only the plainest fare, is, to say the very least of it, indecorous, though sometimes regarded by those who enjoy to the full the benefit of their position with feelings of pride and full

satisfaction as if they were superior because they provided well for themselves. The surgeon should, under such circumstances, rigorously enforce sumptuary regulations and restrain within proper bounds those who, mistaking the true relation of things, entertain themselves with more than is their due share. There is not the slightest reason why such disparity should be allowed to exist and that all the advantage should lie on the side of those who are certainly not more deserving of them. Let the chief aim and motive of all be to minister to the wants of, even to indulge, the sick—the well will generally take care of themselves. The inequalities which have pervaded our armies in these respects are glaring and require to be corrected. Inspectors of the highest character of the antique Roman type, who will not swerve a hair's breadth from their duty, could be employed with the greatest advantage to examine into the "inner life" of commissary, quartermaster, medical, and other departments. But, alas! unless such are selected, the satirist is likely to inquire, quis custo diet ipsos custodes!

I now invite attention to two or three diseases to which the principles laid down are specially applicable, and which have attracted my critical attention on account of their importance.

There is nothing so common, so universally prevalent, and so fatal in its effects upon the Confederate soldier as chronic diarrhœa, particularly during the Spring and Summer months. This is the great scourge of our armies; it coexists with almost every other disease with which he becomes affected, and the best mode of managing it is consequently of interest to us all. It may or may not be, but often is, associated with a certain amount of dysentery, and sometimes chronic dysentery is almost as frequently met with as diarrhœa.

I would banish from the treatment of either that almost universal recourse of every surgeon, acetate of lead and opium. It is true that mineral astringents check the discharges temporarily, and there is often an apparent benefit following their use, but the relief is only fugitive. They are injurious to the Confederate soldier in his impoverished, prostrated condition, inasmuch as he depends upon the integrity of the gastro-intestinal surfaces being preserved for the purpose of assimilating food as soon as possible, in order to maintain a fair balance in his favor in the unequal strife between life and death. The illustration is very common-place, but not less true, that it is a question of plus and minus, and that he has of necessity, whilst the disease is being checked by mild astringents, to receive into his exhausted system enough nourishment to counterbalance the drainage going on. He must absorb and assimilate more than he loses, or he dies.

In the length to which this paper is limited, I cannot enter minutely upon the mode of action of medicines, but with reference to mineral astringents it may be briefly stated: that they act directly upon the mucus membranes by entering into combination with the albumen of the tissues, thus materially interfering with their integrity, disturbing the functions of absoption, and consequently of digestion, which is of such prime importance, in this respect differing in degree, if not essentially, from the vegetable astringents. In the Confederate soldier, weakened and exhausted as he is by his previous life, by exposure and the circumstances which surround him, we cannot afford still farther to impair his recuperative energies by any but those agents which will barely suffice to constringe the relaxed membranes and to gradually diminish the discharges with the least possible injury to the subsequent absorption of enough food to nourish and sustain him.

Of the agents of this class, *vegetable* astringents, chalk mixtures, with demulcents, milk, eggs, arrow-root jelly, with small quantities of brandy or other stimulants, are all that he can have. He must be trusted to time, rest, the recumbent posture, to the recuperative powers of his constitution and to nature.

I have been in the habit of using a tea made of the root of the blackberry, which possesses the advantage that it can be easily obtained in the vicinage of any camp, infirmary, or hospital. The decoction made with an ounce or two of the root in a quart of water boiled down to a pint, may be given in wine-glassful doses, with a little brandy or whiskey added, several times a day. Two grains of Dover's powders, with half a grain of calomel, may be prescribed at night. This, or some similar harmless treatment, should be continued, pro re nata, and be the only one used, with the simultaneous introduction of suitable and easily-digested food in quantities that will be retained and not prove hurtful. Its applicability consists in its mildness. There should be no castor oil, no purgatives, no continual alteratives, repeatedly employed, for they fatally impair the digestive functions, which are absolutely essential to recovery.

In lieu of the decoction of the blackberry-root or the bark of the sweet gum (Liquidambar styraciflua), which is both astringent and balsamic in its properties, I have frequently advised and used largely, with the best effects, an extemporaneous "chalk mixture," which possesses the important qualities of being an absorbent, an astringent, and doing as little harm as any medicine can be divested of. It is prepared thus: Prepared chalk, one drachm; Tinct. opium, two drachms; Paregoric, one drachm; Tinct. of kino or catechu, two drachms; Water, six ounces; a desert-spoonful after each operation.

Some surgeons inform me that they find Hope's mixture beneficial, and others use a demulcent preparation, with a little turpentine added. The latter is serviceable where there is a tendency to dry tongue and distension.

My reasons for combining with two or three grains of Dover's powders at night a small quantity of calomel is, that I have considered the condition of the internal organs in (chronic) diarrhœa somewhat analogous to the diarrhœa of teething children, where the secretory functions of the liver and the glandular system are impaired, and where mercury and Dover's powders, in minute doses, with vegetable astringents, change of air, and proper food are now universally recognized as being essential and the only treatment. Opium alone, or with astringents, are ineffectual.

Assistant Surgeon Frierson informs me that in the hospital in which he was employed, under Surgeon Selden, where convalescents from protracted cases were generally brought, they found great advantage following the use of extract of nux vomica. The reasons of this are obvious, viz: the loss of the accustomed tonicity in the organs requiring a nervous stimulant. It is equally useful in the opposite condition of constipation when dependent upon the same cause. In very violent and protracted cases accompanied with dysentery, and resisting all other treatment, I must admit that I have seen beneficial effects ensue after the use of nitrate of silver with local applications.

Surgeon Fauntleroi, in charge of the hospital, second division, Danville, Va., relies in such cases upon two or three grains at a dose, and he cautions us against the addition of opium, which confines its action too high up in the digestive track.

It has been my plan also to apply blisters occasionally on the left hypogastric and hypochondriac spaces, over

the descending colon. It is, of course, difficult to decide to which particular agent used we are to ascribe most good effects, but I use blisters invariably where there is any dysentery present, for obvious reasons; and the point mentioned is selected because the pain and inflammation is generally found in that locality. They should not be large and exhausting, and should be followed by poultices assiduously applied.

In the treatment of dysentery in the army, it is necessary to use the same caution with respect to active medication. So necessary do I consider this, that as much confidence as I place, after repeated trials, in the salts and laudanum mixture (Epsom salts, two ounces; Laudanum, two drachms; Water, a quart; two tablespoonfuls after each operation, till the blood is checked), or that made with cream of tartar and Dover's powders (Cream tartar, two ounces; Water, a quart: a wineglassful, with four grains of Dover's powders, every four hours), yet I have scarcely even thought these prescriptions warranted in the reduced condition to which most of our soldiers are brought before entering a hospital. So that in this disease I have been compelled to trust to occasional doses of Dover's powder, two grains; calomel, half a grain; given at night, for some mercury is very beneficial, particularly in cases of dysentery depending upon, or connected with, hepatic enjoyment, and consequent reflux upon the mesenteric and hemorrhoidal veins. Dover's powder, in three-grain doses, may be given during the day, and chalk mixture and vegetable astringents so soon as the inflammatory symptoms are in the slightest degree subdued. This treatment can indeed be used at almost any stage of the disease, employing blisters, followed by repeated fomentations or poultices, and giving light food, with milk, rice, arrow-root, etc. Bitter tonics and stimulants may be introduced at the

earliest possible moment, or simultaneously with the course above mentioned. In other words, employ a mild, tentative, soothing treatment, with an avoidance of anything active or calculated to irritate or arrest still farther the digestive and assimilatory functions. In most diseases the general management of the case, with the application of a combination of means, external and internal, to secure certain ends, is more effectual than the use of any particular remedy, though there is great room for selection in these also.

I do not consider these directions as particularly novel —their chief merit, if they have any, is the general direction to which they tend, which will be found more salutary than an opposite one. The surgeon must be cautioned against a purturbative system, which is essentially fatal and destructive, from the nature of the cases which he has to treat.

Not merely for their utility during convalescence from the diseases just mentioned, but for their general benefit, there should be in daily use in all hospitals some vegetable bitter tincture. The compound from the formula in the Surgeon-General's office, known as Moore's tincture, or any preparation or infusion of the bitter barks, wild cherry, willow, dogwood, poplar, one or more mixed with a sufficient amount of whiskey to preserve it and add to its efficacy, should be made in large quantities and daily used in all hospitals, infirmaries, or camps. It must not be left to the assistant surgeons to order their preparation at each time that they are wanted.

The thoroughwort plant, boneset (eupatorium), should also be collected and kept in large amount in the apothecary establishments attached to hospitals, in order that the use of such simple and excellent preparations may be facilitated. These, used as substitutes for mineral medicines, will prove highly beneficial to the service. This is

owing also to their intrinsic values in giving tone to the system, increasing the appetite, or producing vomiting and diaphoresis, laying aside any anti-periodic power they may possess. These varying effects, as in the example of the boneset, depend upon the form in which they are administered, viz: whether cold, tepid, or hot.

Gerhard, in his lectures on the diseases of the chest, recommends very highly both the eupatorium and senega, in decoction, in pneumonia and bronchitis, with the addition occasionally of sanguinaria. I have repeatedly used them, and with great advantage. The employment likewise of neutral mixture, chlorate of potash, effervescing draughts, or other cooling agents, is highly beneficial in a hospital, as they take the place of substances that are of doubtful utility and more dangerous, or less innocuous, in their effects upon the class of patients the army surgeon is called upon to treat.

In the declared pneumonia and bronchitis following measles, for example, it is far preferable to trust to a drink of chlorate of potash water (three drachms to a pint), and the mildest alteratives of calomel and Dover's powder, or morphia, a fourth to a sixth of a grain each, with an anodyne diaphoretic at night; if there is much perspiration, to quinine and aromatic sulphuric acid, and to nourishment, and the healing influences of time, than to attempt to jugulate the disease by any active treatment.

Prof. Chambers, of London, in a recent paper on the treatment of pneumonia by cupping and jacket poultices, to the exclusion of mercury and tartar emetic, republished in the Confederate States' Medical Journal, sustains an opinion I have long and openly maintained as the result of my own experience: that a case of pneumonia never improves so long as there is running off at the bowels. This is absolutely fatal in the disease of the chest consequent upon measles, unless speedily checked. The

tendency to it should be anticipated by opiates and stimulants.

Army surgeons, now-a-days, profess to cure sloughing wounds, gangrene, etc., with the greatest facility with nitric acid, mur. tinct. of iron, and so forth. Some employ poultices. Guthrie (and those following in his wake), condemns the latter out and out, in a wholesale way, with most opprobrious epithets: "cover sluts" and such like terms. One would suppose that Astley Cooper, Liston, Dupuytren, and the great army of able men of a past day, were either mere children, or had been practicing the most egregious errors during their whole lives.

After witnessing a large number of sloughing wounds following the battles around Petersburg, but no gangrene, as this was prevented by securing-tents at all hazards, and disgorging the wards into them, I have endeavored to come to some conclusion as to the relative merits of the agents tested. I find that some things are required besides nitric acid, and that poultices are of the very greatest service when judiciously applied—not only in sloughing wounds, but wherever the inflammatory action is too high, or when we wish to determine to the surface, as in cases of deep-seated matter or abscess. But surely one would hardly be compelled to argue in favor of the utility of any description of poultice in hastening the maturation of a boil or whitlow, in soothing the pain, or bringing matter to the surface. Cold water is applicable and essential at a period when poultices are not, and vice versa. There is no substitute for either. I would not speak dictatorially when I say, in the first place, that in a sloughing wound where there is a large amount of dead matter, sometimes an inch or two thick, concealing the sensitive parts beneath, which you wish your stimulant or escharotic to reach and excite the granulations of, that

it hastens the process extraordinarily to use a pair of scissors and cut it away outright. When you do this (and I have repeatedly seen it save life), whilst giving muriated tincture of iron, quinine, or other stimulating tonics internally, you expose the sensitive layer supplied by blood vessels, and then even nitric acid is hardly needed; for any stimulant, turpentine, alum, sulphate of zinc, muriated tincture of iron, yellow wash, is sufficient to excite the parts to healthy action. Before the use of the scissors, nitric acid, or the "fuming nordhausen" itself are hardly sufficient to act upon the dead inorganic matter, and time is lost.

A charcoal or yeast poultice is often also of the greatest service in hastening the disengagement of the slough, but particularly also in lessening the inflammatory action, which often runs too high, and is the cause of the extension of the sloughing process. In any wound, sloughing or not, where there is too great heat, redness, and inflammation, the greatest benefit is derived from the application of soothing poultices of any description; but particularly from those possessing the antiseptic and absorbent properties mentioned above. This statement I have demonstrated almost daily. Doubtless poultices of any kind can be used too much. I have seen surgeons continue them quite too long. After wounds, after amputations, when the tissues are pale and relaxed, and there is an absence of too great inflammatory action (which is always destructive), poultices are injurious. When employed too constantly, they are often the cause of the flabby, relaxed condition which prevents healthy granulations, arrests the healing process, and produces wasting discharges. The question of their applicability or not is one easily decided.

Nitric acid or other active stimulants, as all admit, are very serviceable in gangrene, with internal tonics which

constringe the cappillaries, employing also highly nutritious food.

I introduced into daily use at the South Carolina hospital, Petersburg, where several hundred wounded men were collected, an agent which is an admirable substitute for Labaraque's wash, Darby's fluid, or other disinfectant or antiseptic preparation. It is a weak solution of commercial copperas in water, which for local application to stumps, sloughing wounds, fetid ulcers, etc., may be made by the gallon. It is a very efficient antiseptic and disinfectant, also a good local stimulant and astringent, and it has been long used in erysipelas; its cheapness, likewise, commends it to the surgeon during the present exigency. My employment of it before the war, in the marine hospital, Charleston, as a general disinfectant for yards, suggested the extension of its use to the wards and for the wounded.

In concluding these somewhat desultory remarks, I cannot but suppose that others may differ from me; but I am fully convinced that the foregoing views are correct in the main, having been found successful as far as my observation extends, and after a good deal of careful attention to the subjects referred to.

ARTICLE IX.

Gunshot Wound of the Spinal Cord, and the ball found in the ascending Aorta. Patient lived ten days. By DESAUSSURE FORD, M. D., Demonstrator of Anatomy in Medical College of Georgia.

Mr. A., of South Carolina, thirty-eight years of age, of full habit, in vigorous health, weighing one hundred and eighty pounds, was shot on the 26th of May, 1866, and I saw him, in consultation with Drs. Smith and Brooker, the 28th, at 11 o'clock A. M. He was standing twenty-

five feet from, and rather obliquely, with his back presenting to a store, from which he was shot, the ball passing through a pane of glass. He was suddenly thrown down, there being instantaneous paralysis and anæsthesia of the inferior extremities. The pistol supposed to have been used, was the largest size Navy Colt's, carrying a conical ball.

The ball entered to the left of the spinal column, opposite the fifth and sixth dorsal vertebrae. The wound had been repeatedly probed, but notwithstanding this, and my aversion to probing wounds often, I used a large size bullet probe, cautiously, which passed two inches deep, obliquely downward, and almost parallel with, but ranging toward the spinal column. I failed to discover any fracture of the vertebrae or ribs. He complained of so much pain in the left side, over the region of the heart, that I examined carefully, by physical exploration, the thoracic viscera, but nothing was discovered which indicated any disturbance of these organs. His breathing was somewhat labored, but the pulse natural and soft, beating eighty-five, the skin pleasant and warm, tongue coated heavily with a white fur, and hiccough, his spirits low, and countenance very anxious. He had been catheterized twice daily, but the bowels had not acted since the accident, although enemeta had been administered repeatedly. He was seen by one of the attending physicians five minutes after he was wounded, who represents that "his suffering was intense; was much prostrated; considerable hemorrhage, say twenty ounces during the first six or eight hours, after which it subsided, and reaction in six or eight hours; constant pain in the chest; great thirst."

In the consultation, I gave the opinion that the probe failing to reach the bones of the spinal column in any of the probings, the absence of any tenderness of the spine

proximate to the wound, with the absence also of crepitus, and the paralysed parts having remained perfectly warm and pleasant, with no increased warmth or coldness, neither clamminess, and the pulse natural, that the ball had probably embedded itself somewhere in the muscles of the back; that the cord had not been injured, and that the paralysis was the result of concussion, rather than either compression or laceration of the spinal cord, or its membranes. We determined to treat the case by repeating enemeta, small doses of sulphate of morphia, and perfect quiet.

He rested quietly until the next morning, when the enemeta failing to bring a discharge, a half ounce of castor oil and ten drops of spirits of turpentine were administered; before this had time for effect, he had a copious faecal evacuation, but was not sensible of it. The oil and turpentine commencing to act, he was rendered so feeble that whiskey punch was administered freely. The night of the 29th he rested quietly, and manifested more comfort and cheerfulness. The pulse, during my stay of two days, was natural, ranging from eighty to ninety, except immediately after the large evacuations from his bowels. The only uneasiness manifested was the constant pain over the region of the heart, with occasional hiccough, which was sometimes violent, but draughts of solution of bicarb. of soda relieved him temporarily; during these paroxysms of hiccough, he complained of excessive oppression over the sternum, and begged to be pressed forcibly at that point for relief.

My father, Prof. L. D. Ford, saw him for me the next day, remaining with him the whole of it, observing only this pain, the hiccough, and spasm of the diaphragm. The bladder was still relieved by the catheter; his condition was considered favorable; was taking nourishment ely, and talking cheerfully. The sensibility of the

paralysed parts was estimated by his attendants to be returning. My father saw him again on the 1st of June, finding him in a comfortable condition, cheerful, pulse natural, appetite good, and although the hiccough still annoying, the prognosis was favorable.

By advices from his attending physicians, he was represented as doing well, when we were summoned to him on the 5th of June, a hemorrhage from the wound occurring on the night before. The bleeding came from the vessels of the spinal column. He was found cold, pulseless, his mind wandering, in which condition he remained until 9 o'clock of this day, when he died.

Post mortem examination was performed by Drs. Smith and Brooker, my father being present, the morning after death, before the coroner and his jury, and under other circumstances not favorable for a critical examination.

The subject upon his face, an incision was made across the wound, down to the vertebral column, and the track of the ball discovered, which passed through the base of the transverse process of the sixth dorsal vertebra, and thence into its body, wounding the membranes of and the spinal cord. To determine the further course of the ball, a section of the vertebral column was removed, including vertebrae below and above the wounded one, separating this section from the aorta from above downward. It was found that the ball passed through the body of the vertebra, leaving some spiculae of bone in contact with the membranes of the spinal cord. This section of the column was then laid aside, and no course or track of the ball was perceptible. The viscera within the thorax were examined by free feeling; the ball not felt, the opening in the posterior part of the thorax was enlarged, by sawing off more of the ribs, and the viscera removed, by dividing the aesophagus and trachea, and the vessels at the top of the chest, and the pericardium cut through

in detaching these viscera from the diaphragm. This disadvantageous mode of removal necessarily caused much mutilation of the viscera; thus the pericardium was necessarily opened, and some incisions made into the heart itself at its apex. The lungs were crepitant throughout. In examining the heart, the ball was felt in the ascending aorta, which was taken out by making an incision into the vessel; the base of the ball was unaltered, but the apex was rough and jagged. The cavities of the heart were opened, and a coagulum, ante mortem, was found in the left ventricle, extending toward the aorta. The inner surfaces of the ascending aorta and its arch were of an intense, deep vermillion color, which extended throughout the entire substance of the arterial coats, and this remarkable pathological appearance was also found in the arteria innominata, but left subclavian and carotid arteries were natural in color. This color was also present in the descending aorta, gradually diminishing in intensity, and confined to the internal coat.

At the base of the left ventricle, at the junction of the pericardium with the aorta, there was an irregular opening in the external tissues, and in the aorta corresponding there was a slit of sufficient length to allow the passage of the ball.

The upper portion of the heart, including the auricles and parts of the large vessels leading from the organ, was brought to the city for more careful inspection. With the assistance of my friends Professor Dugas and Joseph Jones, it has been determined that the ball entered this irregular opening, of a circular form, which was in the posterior portion of the ascending aorta immediately beyond the semi-lunar valves, corresponding to the point where the ball was found; the external tissues about this opening were bruised, the edges of it lacerated, and looking inward, while the elastic coat had the appearance

of having been incised, which must necessarily be the case in wounds by balls of the elastic coats of large arteries, the rent being in the direction of the fibres.

It is to be noted here as an important feature in this case, the remarkable vermillion color of the aorta and arteria innominata, indicating that this ball, probably, at each contraction of the left ventricle was thrown forward in the ascending aorta, by the advancing column of blood, up toward the arch, which it did not pass, and by the elastic reaction of the aorta, was then thrown back upon the closed semi-lunar valves, and that here this ball was dancing during the life of the patient, being a continual source of irritation. Why the intense color was not found in the left subclavian and carotid vessels I cannot conjecture. This remarkable pathological condition about the point where the ball was found, with the abiding distress in the region of the heart, this occasioned probably by the coagulum, the formation of which may have been due to the presence of this ball immediately beyond the valves, is conclusive evidence that the ball rested in the ascending aorta from the moment of the accident.

Wounds of the heart and its vessels, the subjects living for days and even months, are not of such rare occurrence. Dr. Cristison reports a case where a ball was found in the left ventricle of the heart, yet there was no opening through which it entered; "the patient lived from April 14th to about the end of June, when he suddenly expired." A case is reported by Dr. Latour, chief physician to the Duc de Berg, where the ball was found in the right ventricle, resting upon the septum medium. There was great hemorrhage immediately after this wound, but on the third day he was more comfortable, and, at the end of three months, the wound cicatrized, and he suffered with only occasional palpitation three years; six years after, he died. Post mortem examination

disclosed a cicatrix in the right ventricle of the heart, and the ball resting upon the septum medium. Dr. James M. Green, of Macon, Ga., reports a case, in the *Southern Medical and Surgical Journal*, 1855, of a wound of aorta, the patient living a month, and then dying not from its effects.

The case of the prize-fighter, Poole, of New York city, is reported under the head of gunshot wound of the heart. The ball lodged in the septum between the ventricles, without symptoms indicating its presence. Another case of spontaneous cure of a wound in the ascending aorta is reported in the London *Lancet*, 1837; vol. xxxiv. These cases I have referred to as noted in "Eve's surgical cases."

ARTICLE X.

Report of two cases of Primary Resection at the Knee-joint for gunshot wound; death resulting in both cases. By SAMUEL LOGAN, M. D., Demonstrator of Anatomy and extraordinary Professor of Anatomy in the Medical College of the State of South Carolina, lately Surgeon in the Confederate States Army and Medical Inspector for the Department of North Carolina.

CHARLESTON, S. C., July 27, 1866.

PROF. JOSEPH JONES, M. D., Augusta, Ga.—

Dear Doctor: Please receive my thanks for the copy of the Journal as well as for your kind note accompanying it. In accordance with my promise made to you at the time when I had the pleasure of receiving your agreeably remembered visit at Pocotaligo, during the war, I had set to work in good earnest to condense, revise, and arrange the medical statistics of the department of South Carolina, Georgia, and Florida, having procured the original reports from the Medical-Director's office for the purpose. I had prepared over one hundred pages of the manuscript, and was progressing in the work, when the exigencies of the service in Virginia caused my transfer, with most of the command, to that more active

field of operations. My work was thus brought to a stand still, but hoping at a future day to be able to resume it, I left the papers at my father's house, in Columbia, where they, together with all my other manuscripts, and my whole library, were destroyed by fire, by the "great incendiary" of "our common country."

I had a few professional *war notes* with me in the army, such as I had more recently collected, and had had no opportunity to send home *for safety*, as I then supposed. These I have saved, and from among them I have made up a report of the only two cases in which I deemed myself in the least justified in performing primary resection of the knee-joint for gunshot injury. The details are rather meagre; but as all such cases should be recorded, I send the report to you.

I congratulate you on the success, comparatively, of your college. We have reorganized and somewhat rejuvenated our institution, and promise you to try at least to hold our own. We were fortunate in losing very little by the war.

With sincere regard, I remain, your's sincerely,

SAMUEL LOGAN.

First.—J. P. Goforth, Private Co. K, 11th regiment S. C. volunteers, aged about twenty-five years; robust constitution and in good health; was wounded June 24th, 1864, near Petersburg, Va.; was admitted into the "field hospital" of the division, located in the city of Petersburg, about two hours after the receipt of the injury.

Pulse about ninety; no shock or constitutional disturbance of any importance; general condition, indeed, calm and good. Gunshot wound runs obliquely through left knee-joint, tearing away both articular surfaces, but producing no splintering of the cancellated structure or shaft of either of the bones, merely making a *groove* along the articular surfaces of the femur and fracturing the patella.

A general hospital, where he could be permanently treated, being in the immediate vicinity—not a quarter of a mile distant—and the case, on account of the nature of the wound as well as the excellent state of general health,

being considered as one in which the operation might be regarded as justifiable, while at the same time the patient preferring any risk to the loss of his leg, I determined upon resection.

The patient being placed under the influence of chloroform, the operation was performed a few hours after the receipt of the injury (June 24, 1864), by the H incision, the cross cut including both orifices of the wound.

Nearly all of the contused soft parts were excised, with the patella also, after the articular surfaces of the bones had been sawed off beyond their contused portions. The parts then seemed to present very favorable conditions for speedy union.

I consider that the removal of the bruised soft tissues contributes very materially to this result in this as in all other resections for gunshot injury, and I have always carried this principle into practice, except when a too free excision of the soft parts would involve the injury of important structures. I think that with this precaution the removal of such contused tissues should be adopted as the rule of action in such cases.

The patient soon reacted from the effects of the chloroform, and was sent to one of the general hospitals in the immediate vicinity, a long splint having been applied to the limb as a temporary expedient to facilitate his immediate removal from among the crowd of wounded who were awaiting professional attention.

June 28th. Had been too much engaged to go to see the patient before to-day. Pulse now about one hundred and ten; skin a little unnaturally warm, but moist; tongue almost natural; feels tolerably comfortable; appetite good; part slightly swollen, but not painful; limb dressed in Smith's anterior wire splint, and suspended, water dressing by irrigation being used.

July 1st. Patient not doing so well as at last visit. He is restless, and his skin is hotter; face flushed; pulse one hundred and fifteen or one hundred and twenty, and tongue rather dry; parts much swollen and somewhat erysipeloid in appearance; suppuration commencing imperfectly. There has, however, been some union of the lips of the wound. Water dressing is still used. Other cases of erysipelas have occurred in the hospital.

I regret that I was unable to see this patient again, but I afterwards ascertained that he had died within the twentieth day after the operation; I could not ascertain the precise date.

Second.—J. White, corporal, Co. I, 21st regiment S. C. volunteers, robust-looking young man; apparently about twenty-five years of age; admitted into the division field hospital, in the city of Petersburg, Va., June 24, 1864, about two or three hours after being wounded. General condition good; pulse strong, and about eighty-five; skin warm, and healthy in feeling; no shock, or if there had been any he had recovered from it.

Upon examination, a wound, probably from a conical ball, had passed through the external condyle of the right femur, laying open the joint freely, and knocking off a portion of the articular surface. The tibia was uninjured. He had also a slight flesh wound in his right arm.

The case being considered as one almost as favorable as the last, and the external circumstances being precisely the same, it was determined to give him also whatever chance of saving the limb a resection might afford. I accordingly performed the operation immediately, by the H incision, removing both articular surfaces, sawing through the femur at about one inch from the joint, merely slicing off the top of the tibia, and removing all of the contused soft parts.

The recovery from chloroform was prompt, with a healthy amount of reaction, and he was at once sent to one of the general hospitals in the immediate vicinity, with the limb bound, with tolerable firmness, to a long external splint, as a temporary expedient and to facilitate his comfortable transportation.

June 26th. Visited patient at hospital. The immense crowd upon the capacity of the hospital has necessarily lessened the degree of attention which he otherwise might have received. His bed is not comfortable, and the limb is still dressed in the temporary apparatus applied at the field hospital, which is causing some pain by its undue pressure. He is restless, with some reactionary fever, though not a great deal. Pulse about one hundred and fifteen; tongue almost natural; skin healthy and soft, perhaps a little too warm; the leg is somewhat swollen at the seat of operation.

June 27th. General symptoms much the same, but is more comfortable, the dressing having been rearranged. The limb is about as much swollen as it was yesterday, but it is only a little above the natural temperature, and gives him no pain.

June 28th. General condition much the same, but the flesh wound in the arm is not doing well. It is painful, and the parts around are swollen and red, presenting somewhat an erysipeloid appearance. The leg is the same as yesterday; in almost a natural state, if we except the slight swelling present; union appears to be taking place quite healthily. He complains of the arm, and not the leg. He still has on the same dressing.

July 8th. Have been unable until to-day to see the patient since the 28th ult. He has been removed from the tent he first occupied to a ward in one of the buildings. His general condition is rather favorable; pulse about one hundred and ten; skin moist; appetite good;

tongue soft and tolerably clean; feels more comfortable. The erysipeloid tendency in the wound of the arm has disappeared; the leg is somewhat swollen at and around the site of the operation; the wound is suppurating freely and the pus is healthy.

All retentive apparatus has been removed; nothing but what was applied at the field hospital having been ever used, and this had caused some excoriation. The limb lies free; thus every motion of the body, or foot, disturbs the relations of the osseous surfaces, and produces friction between them.

I was unable to see the patient again, but I afterward heard that he had died at some period before the 15th of July, or within twenty-one days after the operation was performed.

The notes on the above cases are necessarily imperfect; but it is believed that they are sufficiently full, though wanting in so many details, to render it worth while to report them.

The exigencies of my official duties at the time, and afterward, prevented me from procuring more full particulars, especially as the cases immediately passed from under my professional care. This latter circumstance will account for the absence of details as to the treatment. In forming an opinion as to whether the operation of resection at the knee-joint is *ever* admissible as a primary operation for gunshot injury, it is very important that we should have as many reports of cases as possible. It is with this view that I have deemed it advisable to hand in the results of my experience in the only two cases coming under my hands during the recent war, in which I considered that the condition of the patient, coinciding with the favorable circumstances which I had reason to expect would obtain, during the after-treatment, warranted this attempt at conservative surgery.

In respect to the influence to be allotted to these cases, in forming any generalizations on the subject, it is necessary to qualify our judgment as to the results, by bearing in mind that it was only in the case of private Goforth that the favorable after-circumstances obtained, on the presupposition of which the decision as to operating was mainly based.

The circumstances attending the after-treatment of the case of corporal White, whether avoidable or not, were certainly not such, to say the least, as ought to be expected to contribute to a favorable termination.

Taken by themselves, these cases, of course, settle no principle, but aggregated with others, it is hoped they may contribute to that result.

TRANSACTIONS OF SOCIETIES.

Medical Society of Augusta, Georgia.

The Medical Society of Augusta was reviewed and reorganized on the 23d of May, 1866.

The members have displayed commendable zeal, and a number of interesting questions, as the possibility of communicating secondary syphilis, through the medium of the vaccine virus, the nature and effects of the malarious poison, and the pathology and treatment of puerperal fever, have been discussed at the bi-monthly meetings.

The following Essays, read before the Society, are published in response to a resolution, requesting the editor of the Southern Medical and Surgical Journal to open his pages to the publication of the transactions.

The officers of the Society, as at present constituted, are :

President, L. A. Dugas, M. D., Professor of Surgery in the Medical College of Georgia.

Vice-President, S. E. Habersham, M. D.

Secretary, V. G. Hitt, M. D.

ARTICLE I.

Affections of Difficult Diagnosis Caused by Diseased Teeth. By Dr. J. P. H. Brown, of Augusta, Ga. Read before the Medical Society of Augusta, June 20th, 1866.

The presentation of this paper, for the consideration of this Society, is done with no little diffidence and embarrassment. First, I have a consciousness of my inability to do the subject justice; and, Secondly, occupying the position of a dentist, I feel that the ground over which I must pass requires delicate stepping, lest I may be thought transcending my sphere.

We must view man as a microcosm—a little world—made up of many parts, which are so intimately united, and dependent upon one another for integrity and existence, that when we ignore one we not only mar the beauty and destroy the harmony of the whole, but our knowledge of their structure must also necessarily be imperfect.

A knowledge of structure forms the basis of all surgical and medical practice, and is equally necessary for those who wish to understand the nature and character of disease; for without a knowledge of the laws governing the life of a part all treatment is empirical. Experience may sometimes enable us to treat successfully a certain disease under certain circumstances, but experience, by itself, leads to mere routine and hobby practice. There are many men in my own profession who are so *pre-eminently* practical that, by means of forceps and excavators, they have completely detached the teeth, if I may so speak, from all connection with the living organism, and bidding adieu to all physiological and pathological knowledge, have rode their routine hobby into charlatanism. These practitioners never stop to inquire how the cure is really accomplished, and what is worse, they never deviate from one set course of practice; and whatever may be the condition of the part, or of the patient, their treatment remains the same.

The accomplished physician, surgeon, or dentist must possess both experience and theory, which includes not only a thorough knowledge of structure, but also a knowledge of the application

of those remedial agents brought into requisition in the treatment of disease. For this seeming digression from my subject I hope you will pardon me.

I trust you will not think it improper, or outside of my legitimate province, if I ask your attention, for a few moments, to a brief but general consideration of some of the influences and effects which the teeth, when diseased, may have upon the other parts of the body and upon the general health. When we take into account that the teeth are vitilized structures, endowed with nerves and blood-vessels, and, through these nerves, are intimately connected with the great sympathetic nervous system, and through this with all the organs concerned in the production of animal life, the varied influences they possess become an additional field of observation. It must be apparent, therefore, to every medical and dental practitioner, that a knowledge of the anatomy and physiology of the *fifth pair of nerves* is indispensable to a proper appreciation of those pathological conditions to which these nerves are liable, and of their sympathetic derangements primarily induced by dental irritation.

Dr. Bond, in his work on "Dental Medicine," when referring to this subject, says: "As the body is a unit, knit by the closest bonds, pervaded by one system of blood-vessels and nerves, directed by one intelligence, and kept in a continual relation of function and expression by an all-pervading law of reciprocal reaction and sympathy; as diseases of other parts, and those which, in distinction to well-defined and limited affections, we call general, are capable of affecting the teeth, it might be apparent, if we had no particular facts in evidence, that the morbid condition of the teeth may produce corresponding evils in other parts, and may even involve the whole system in troubled and morbid action.

"It might also be evident that severe and long-continued pain, located in the immediate vicinity of the brain, and in parts little accessible to soothing appliances, can not be less dangerous to health than pain in other organs situated at greater distances from the nervous centres and more easy of access.

"It might also be perceived that sensitive organs, in immediate

contact with the great living membrane of the thoracic and abdominal cavities, and intimately connected with it by function, can not be less capable of propagating disorder to it than parts located far from it, and having no immediate relation to it."

In commenting upon the effects of diseased teeth upon the system, Dr. Rush, one of the most comprehensive and accurate pathological observers that ever lived, remarks: "When we consider how often the teeth, when decayed, are exposed to irritation from hot and cold drinks and aliments, from pressure, by mortification, and from cold air, and how intimate the connection of the mouth is with the whole system, I am disposed to believe they are often unsuspected causes of general, and particularly of nervous, diseases. When we add to the list of these diseases the morbid effects of the acrid and putrid matters which are sometimes discharged from carious teeth, or from ulcers in the gums, created by them; also the influences which both have in preventing perfect mastication, and the connection of that animal function with good health, I can not help thinking that our success in the treatment of all chronic diseases would be very much promoted by directing our inquiries into the state of the teeth in sick people, and by advising their extraction in every case in which they are decayed. It is not necessary that they should be attended with pain, in order to produce disease; for splinters, tumors, and other irritants before mentioned, often bring on disease and death, when they give no pain, and are unsuspected as causes of them. This translation of sensation and motion to parts remote from the place where impressions are made appears in many instances, and seems to depend upon an original law of animal economy."

As natural as these inferences are, and as important as they must be to every reflecting mind, I hope you will pardon me when I advance the opinion that the medical profession generally have not paid that attention to this subject which its importance demands. Without wishing to tire your patience, I will give a few cases, showing some of the disorders that occasionally arise from dental irritation.

Case 1. *Abscess and loss of a portion of the hard palate, caused by the irritation of a diseased tooth.*

This case came under my notice some seven years ago, in Atlanta. The history was related by the patient himself. Some four years previous to my seeing the case, an abscess formed in the centre of the palatine arch, which was lanced by his physician, and a large quantity of pus discharged. The place did not heal, but left a fistulous opening, which continued to discharge small quantities of matter. Finally, the edges of the opening inflamed and enlarged to the size of a filbert; the discharge consisting of pus and sanies.

One of his central incisors becoming troublesome, it was extracted, when it was found that there was a fistula running from the root of the tooth to the opening in the palate. The discharge of pus soon ceased, but a portion of the palatine bone necrosed and exfoliated, leaving an opening in the hard palate of the size of a ten-cent piece, which communicated with the nasal cavity, rendering the performance of the functions of mastication and deglutition very difficult, and greatly impairing his speech.

For this gentleman I constructed an obturator, which he wore with comfort and satisfaction. I will here remark that this patient was free from syphilitic taint, but had what may be termed a scorbutic diathesis. He informed me that caustic had been freely applied to the abscess, and he had taken internal remedies, but he could observe no improvement in his case until after the extraction of the diseased tooth. In subjects of this constitutional indiosyncrasy, the slightest irritation of a dental nerve may involve the death of the tooth; or, the irritation may be reflected to some neighboring part. The teeth of such persons always require the most careful and thorough treatment.

Case 2. Sir Astley Cooper, in his "Surgical Lectures," has recorded the following cases as illustrating what he terms sympathetic irritation.

A lady, in Essex, had for a long period been afflicted with a fungoid granulation, which protruded through an ulcerous opening in the cheek, and which had resisted the use of every means.

Upon stating one day that a tooth near the part was occasionally painful, she was recommended to get it drawn; the tooth was extracted, and the fungus quickly disappeared.

"A gentleman of my acquaintance," says Sir Astley, "had, for many years, been exceedingly annoyed by an ulcer on the chin; every attempt to heal it having proved ineffectual, it was considered incurable. At length, one of the teeth opposite the wound becoming painful, it was extracted, when, to the delight and astonishment of the patient, his malady disappeared."

The eruption of the *dentes sapientiæ*, especially those of the lower jaw, is frequently attended by great suffering, and may give rise to serious disturbance. Velpeau relates several cases in which mal-position of the wisdom tooth was followed by necrosis and exfoliation of large portions of the inferior maxilla, fungus growths, immobility of the jaws, epilepsy, and insanity. The nervous disturbance is sometimes so distant from the seat of the primary cause as to present serious obstacle to a correct diagnosis.

Case 3. *Hysteria from the eruption of a wisdom tooth.*

Dr. B. W. Richardson, senior physician to the Royal Infirmary (London) for diseases of the chest, in his lectures on "the medical history of diseases of the teeth," relates the following case:

"A girl came under my care in 1855, and remained as a patient for many weeks. Her symptoms were those of hysteria, but from the description of the fits which, according to the mother's statement, she suffered from, I judged that she must be subject to epilepsy, or at least to severe epileptiform hysteria. I treated her first with tonics, but no good having resulted, and feeling that some local mischief must be at work, I gave purgatives on the speculation of the presence of tape-worm or lumbricus. It was clear that tonics did not relieve, and that depressants increased the malady. Ultimately, there were general twitchings in the muscles, not exactly amounting to chorea, but such as are seen sometimes after the administration of strychnia. I was unavoidably kept from dispensary work for a few weeks, and returning to it was surprised to find a great improvement in this patient. She had been in great pain and had cut a wisdom tooth, since which

she had lost all symptoms of convulsive start. How I blamed myself for carelessness in not having examined for this simple cause of irritation, I need not say. How quickly I should have examined for it had my patient been in her first, instead of her last dentition, I need not explain. Suffice it, that I never meet with hysteria now, of extreme kind, if the excitant seems to be local, without asking in the most solicitous manner after the wisdom teeth."

Dr. W. Tyler Smith, a medical writer of distinction, remarks that: "Irritation of the *tri-facial nerve* seems, in rare cases, to excite abortion. It happens when no cause can be recognized but the appearance of the dens sapientia, and this phase in dentition is known to produce considerable local and constitutional disturbance. General convulsions may, in fact, be excited from this source, either in the male or female subject. The reflection of irritation from the tri-facial upon the uterine nerves, in young pregnant women, is no more remarkable than the strangury excited by teething in the infant."

I might enumerate cases of amaurosis, neuralgia, headache, tetanus, rheumatism, and dyspepsia arising from dental irritation, but the foregoing are sufficient to fully impress the mind with the importance of the subject. I will close this paper with a quotation from Mr. Liston, in his treatise on surgery: "From the presence of carious teeth, or decayed portions of teeth, many evils, both local and general, may ensue, besides inflammation and abscess. They are frequently the cause, *and the sole cause,* of violent and continued headaches; of glandular swellings in the neck, terminating in, or combined with, abscess; of enlargement and inflammation of the tonsils, either chronic or acute; of ulcerations of the tongue and lips, often assuming a malignant action from continued irritation; of painful feelings in the face, tic-douloureux, pains in the tongue, jaws, etc.; of disordered stomach, from affections of the nerves or from imperfect mastication; of continued constitutional irritation, which may give rise to serious diseases."

ARTICLE II.

The Probable Causes of Malaria and Epidemical Diseases. Read before the Medical Society of Augusta, Ga., July 18th, 1866. By Col. George W. Rains, formerly Professor of Chemistry in West Point, U. S. A.

Mr. President, and Gentlemen of the Medical Society:

In speaking on the subject for this afternoon's discussion, I think it proper that I should first state my views as to the nature of force, so far as to explain the term *points of force* employed in the question proposed. To give a comprehensive definition, I should say that Force is anything which can cause motion, either in bodies or in the ultimate atoms of matter. This definition would then include as forces sound, heat, magnetism, light, electricity and chemical affinity, actinic or photographic rays, nervous influence and vital action, as well as gravitation, cohesion, etc. These primary forces act in connection with the ultimate atoms of matter to which they impart motion, and as each atom is supposed to be indefinitely small, we may regard them practically as mere mathematical points. What may be the actual dimensions of such particles, is a question which has never been answered. We know, however, that if we reckon them up in weight, in parts of a grain, or in dimensions, in parts of an inch, we should have to employ the term billions, at least, or more probably quadrillions; indeed, the belief is entertained by many, and is daily gaining ground, that they have no dimensions at all, but are truly mathematical points, whence emanate attractions and repulsions. The air around us is composed of such atoms, each one associated with heat, light and electricity; hence each atom may be regarded as a mere point, from which radiate forces in straight lines, or rays in all directions; or we may say the air is composed of points radiating forces, or simply points of force.

The belief has generally been entertained that there are marked differences and broad distinctions between the inorganic and organic worlds, as well as between the vegetable and animal kingdoms. I think, however, that to-day the certainty of such conclusions is far less strong than it was considered some fifty

years ago. Every day we appear to break down some of the separating barriers, until some believe that after a time there will be but slight obstructions left, if indeed there shall be any left at all. Between amorphous matter and a highly organized vegetable, there exists a deep gulf of separation; also between a tree and an animal; but between the lowest vegetable structure and the highest inorganic form the difference is not so striking; the lower organisms mingle insensibly together, so at times it is difficult if not impossible to say which is the vegetable and which the animal.

In the frosty forms on windows in freezing weather, we have beautiful representations of some of the palm species; and when nitrate of silver is crystalized and viewed in the microscope, and colored green by polarized light, it would be taken by any one not acquainted with the facts to be a growing shrub or sprig of moss, the representation being perfect. It is said that if bichromate of potash be crystalized on a film of gelatine, not only is a tree-like form produced, with its limbs and branches, but actually rhomboidal fruit appears to hang pendant in the foliage. Again, granules of starch, which is a vegetable structure, regularly formed by growth in the cells, when viewed in the microscope by reflected light, looks very much like transparent rounded crystals. The constituents of all organisms, whether vegetable or animal, are mineral elements, and it was long supposed that the peculiar combinations of those elements selected by the vegetable and animal kingdoms could not be formed in the laboratory, but were the exclusive results of life-action. It is now well established, however, that this was an error, as not less than one thousand of such organic compounds, such as urea and its compounds, acetic acid, methyle, amylene, the alcohols, napthaline, glycerine, grape sugar, etc., have been produced artificially or without the agency of vitality.

All vegetables and animals are mainly composed of air and water, the latter holding carbonic acid in solution, and only two or three per cent. of other matters. Motion can not be held as the characteristic of the organic world, since certain vegetable germs have no motion, and finely divided matter diffused in liquids in many cases has a distinct molecular movement, and the crystals of

camphor in small fragments move about on the surface of water with considerable activity, closely resembling the movements of some of the infusoria. Crystals grow in size by attracting such particles in the surrounding solution as are suitable to their formation; the same thing is done by vegetable organisms. The hard seeds of plants, when placed in a watery solution of such elements as are required, will decompose, or its constitution will be broken up, by attracting and assimilating the proper materials, and the result is a shrub or plant. Also, if a piece of zinc be placed in a solution of acetate of lead, it will partially dissolve, and at the same time will attract the precipitated atoms of the metal in solution, and the observed result will be the growth or formation of a beautiful metallic shrub.

In making these comparisons, I do not pretend that we are unable by examination to say which is the organic form and which the inorganic structure, but merely to draw attention to the fact, that the broad distinctions hitherto held as existing between the organic and inorganic worlds no longer exist; that as the animal forms imperceptibly pass into the vegetable, so those of the latter, when our knowledge shall be more extended, may also be found to gradually fade into inorganic structures.

The power which attracts the atoms of amorphous matter together we call chemical affinity, or chemical or electrical force, and that which holds together particles of the same kind we term cohesive force; crystalic force attracts and unites the atoms into regular forms, and vital force attracts and unites the proper atoms into organized forms. It is not seen why this latter force should be considered as differing from the others, except in being of a higher order. They are all means or agents in the hands of the great overruling Intelligence to work out His designs and fulfil His plans.

Having thus set forth in detail, as far as my limits will permit, what I understand by the term force, and points of force, I will now pass on to the consideration as to whether such points of force may not exist intangible to the senses which may be capable of self-division, equivalent to propagation or multiplication.

The first appearance of a new existence or formation, whether

it be animal, vegetable, or mineral, is a minute transparent point just perceptible to the highest powers of the microscope. As it grows or expands by assimilating the suitable surrounding elements, if it be a mineral, it assumes some definite crystalic form; if an organism, it is observed to be more or less globular in form, and consisting of an outer enveloping sac enclosing an albuminous liquid or semi-liquid, and having a dot or nucleus in its centre. In the earlier growth, in some instances, there appears neither enveloping sac nor nucleus, but merely a rounded mass of gelatinous substance. Such is the beginning of all life, from the simplest photophyte to the varied and exceedingly complex structure of man, as is well known to those whom I now have the honor of addressing. In the formation of the crystal the ultimate composing atoms or points of force appear to act in certain directions with more energy than in others; and hence, in their association, the resulting form is in general angular, or developed with regard to certain fixed lines, axes, or poles. In the growth of the organic structure, the vital or formative force appears to act or radiate from the centre, in the primitive vesicle. If we suppose a single point of force acting in all directions, but with power lessening as the distance increases from the centre, and that to a certain distance it is attractive to certain elements in the surrounding medium, but beyond such limit the attractive force becomes too feeble for such an effect, then there would result a globular form of organized matter, or in other words a living existence of the simplest kind.

In the further development of the simple organisms, a constriction begins to appear apparently without cause, which, becoming more and more defined, ultimately ends in dividing the cell or individual into two perfect cells or existences. In this operation, the point of force acting from the centre, and represented by the dot or nucleus, began to divide itself into two parts simultaneously with the first appearance of the constriction around the cell or globule. It would thence appear that the division of the central point of action into two parts necessarily determined the division of the enveloping cell into two individuals. Each new cell thus formed repeats the process of forming two separate cells, and thus

proceeding in a geometrical ratio until, within a few hours, the number perhaps may be counted by millions.

In some cases, if two of the cells after separating touch each other, the point of meeting dissolves away gradually, until the two cells entirely mingle their contents, and a single cell is the result. The product of such fusion or conjugation is remarkable, for the compound cell dries up into a hard grain or spove, which may last indefinitely, floating about in the air, or under favorable conditions will develop cells similar to the original ones, which by binary division will form new structures of agglomerated cells covering extended areas. The growth of such plant is favored in some cases by cold and damp, whilst the union of two separate cells into one, or the act of generation resulting in the spove, is promoted by heat and dryness. Thus, during the Spring and cooler part of the Summer, such kind of vegetation may grow luxuriantly, but it requires the hotter and dryer portion of the season to develop the sporules, which, from their minuteness, are carried off by every passing breeze. The size of the spoves in some species of the cryptogamia is very small: thus I have measured the average spove of the stysanus caput medusæ and found it about the one five-thousandth of an inch in diameter, or so small that such a drop as would adhere to the point of a needle would contain sufficient space for fifteen millions. Indeed, there appears to be no limit to the smallness of size in the minutest organisms of infusorial life, and as the power of the microscope is increased it brings new, and before invisible, points of life into view, just as the increased powers of the modern telescope resolves into mathematical shining points the distant nebulæ of space. It is then clear that organisms capable of self-division and propagation may and probably do exist beyond the utmost powers of our best microscopes, and hence that countless sporules *may* float in the air invisible to man, although assisted by the highest powers of modern art. Such existences we may call sporules, atoms, or points of force, and they may ever remain as invisible as the particles constituting the various odors, and can only be known to exist, like the latter, by their effects on the exceedingly subtle nervous or vital forces.

I will now examine into the effects on the nervous and vital forces produced by the introduction of sporules into the circulating system, either by inoculation or by being drawn into the blood by inhalation of the air in which they float. It will be premised that the vital force of an organism attracts each atom of its structure, or that each atom is enveloped by the vital force precisely as it is enveloped or conjoined to the force of heat, and when such atom shall be removed from the general system, it carries with it its corresponding envelopes of associated forces; hence the loss of a certain number of atoms composing the structure of a living organism would result necessarily in the subtraction of an equivalent amount of vitality.

On the introduction of the sporule or germ into the blood, a contest immediately arises between the vital forces of the spove and those of the blood: the former endeavoring to attract to itself the nutritious elements of the latter suitable to its development. If the animal be in vigorous life, all the forces of its system are in full activity, and the spove seeks in vain to overcome the resistance opposing the disintegration of its constituents. If, however, the number of sporules or germinal cells introduced into the blood be so great that their combined power exceeds the resisting forces of the latter, or if from other cause the vital force of the blood should have been previously reduced too low, then the attractive power of the sporule will succeed in drawing to itself such of the elements of the blood as it may require, and the development of cells having commenced, proceeds with accelerated rapidity by self-division and reproduction.

Thus the constitution of the blood is gradually disorganized; each removed atom has taken with it a portion of the vital force; the energies of the system become impaired; the portions of the blood disorganized by the attractive forces of the sporules, withdrawing some of its constituent elements, remain as foreign matter which must be eliminated. Thus additional work is thrown on the excreting organs, already weakened by the abstraction of a portion of the vital force from the general system. The loss of vital energy, and the deteriorated condition of the nutrifying fluid, prevents its full normal action, and an increased waste of

tissues takes place, the components of which have also to be removed from the system by excretion or combustion. This disturbed condition of the general function of the system results in fever, a particular discussion of which, as well as of the chill which precedes it, does not immediately belong to the subject under consideration.

What is that which vitiates the air in particular localities, producing intermittent, remittent, and bilious affections? has been a question probably from the earliest ages of civilization. The bad air or malaria of the Poretine marshes ages ago caused the wealth and fashion of Rome to leave the pestilential atmosphere of the city during the two warm months of Summer, and seek a purer breathing medium in healthier localities.

Everywhere, when the warmth, moisture, and fertility of the soil is favorable for the rapid production and decay of vegetable and animal life and tissues, we find malaria. Thus marshes, swamps, and stagnant water in warm climates, or during the warm season of the year, infect the surrounding air, as is well known; even in healthy localities, if the firm soil for the first time is broken up, thereby exposing innumerable vegetable fibres to rapid decay, and perhaps also releasing imprisoned sporules and germinating points, malarial influence is experienced. Thus in the comparatively healthy districts of South Florida, in 1848 and 1849, I found in every case where the soldiers broke up the ground, whether for the purpose of policing and ditching the camps, throwing up earth-works, or in gardening, malarial fevers ensued, notwithstanding every precaution was taken to preserve health; and when, at certain points considered very unfavorably situated, I took the precaution to prevent any disturbance of the soil, the men under my command enjoyed good health for such localities. Thus new agricultural countries must abound in malaria, because of the breaking up of new soil, and old cultivated districts become healthier, because of the gradual decomposition of those organic matters which were peculiarly favorable for the generation of poisonous fungi, sporules, or exhalations. Hence even in old districts the dwelling-houses should not be in the midst of cultivated grounds, but as far as practical removed from

them; not the *sides* of hills or elevations fronting on plantations, swamps, marshes, creeks, or rivers, but beyond the crests of such rising grounds. The warm rays of the sun striking such elevated places with more freedom than the shady bottoms, cause a rarefaction of the air, which rising more or less vertically, has its place supplied by the poisoned air of the low grounds. Thus, a dwelling on the side of a hill, unless protected by a thick growth of trees, would be exposed to a daily current of malarial atmosphere from the bottom lands, and would be in a worse situation than if located on the lowest adjacent land.

Warmth, moisture, and decaying vegetable matter are suitable conditions for the growth, in general, of cryptogamia with the rapid evolution of the innumerable sporules of the fungi. From the circumstances attending the production of malaria, it would appear to be either air containing floating sporules, germinal vegetable or animal cells, points of force capable of propagation, or air mixed up with the diffused gases arising from organic decomposition.

At Mont-faucon in Paris, there are extensive enclosures called Huacker-yards, where thousands of animals are slaughtered as worthless, or the dead bodies carried there to save the skins and to allow the carcasses to putrefy for the purpose of manure. From this mass of putrescent animal substances are evolved all the gases given off by vegetable decomposition, and several others in addition, of the most nauseous and disagreeable odors, involving ammonia and the compounds of sulphur and phosphorus. Notwithstanding, the numerous workmen with their families who live in the midst of this most offensive effluvia preserve excellent health; indeed, the family of one of them named Friand, consisting of his wife and five children, were in remarkably robust health, although they had all the year round worked and slept in a place which was actually unapproachable, on account of the stench, to the members of the Commission appointed by the Government of France to examine into the matter. Moreover, these workmen live to be old men and women, many above seventy and eighty years of age.

Again, all the gases given off by vegetable decomposition are breathed at times in the laboratory of the chemist, in a more concentrated condition than ever takes place in the natural decomposition of such bodies, without any malarial effects whatever. It is

true, the long breathing of carbonic acid and carbonic oxide, when in appreciable amounts, will lower the vitality of the system, and perhaps, in conjunction with other causes, may at times produce typhoidal disease, like anything else which would diminish the energies of the body whilst certain conditions prevailed; but I presume there exists no accredited case of a healthy person living in a healthy atmosphere who has had malarial fever from the effects of any single or compound gas.

In the matter of epidemical poison in the air, there is still less foundation to suppose it results from the admixture of a deleterious gas or exhalation. It is well known that Asiatic cholera was engendered in the Souderbund marshes of the Ganges in India, and thence spread through the English army in 1817, whence for the first time it became the terror of the civilized world. In the same district of country a pestilence like the plague, preceded by cholera, arose in 1860, and for the three succeeding years swept off many thousands of the inhabitants. Dr. Elliot, of the army, who was sent to report upon the disease, attributed it to malaria and water filled with decaying organisms.

It is evident that, whatever may constitute epidemical poison, it can not be gases, since it propagates itself, and extends from place to place, far beyond the original locus. It must be, then, either a peculiar propagating organism, propagating points of force, or an electrical phenomena.

But how can electricity act? It is a primary force like light and heat, and like them is diffused in matter and throughout space. It can indeed energize the oxygen of the air into ozone, and can diminish its normal activity into autozone, and such changes might doubtless cause variations of health throughout wide districts of country. But why should electrical action follow particular streets of a city, or one side of a street, or one bank of a river, or follow exclusively the lines of travel? Electric force can not be carried about in the clothes, or propagate itself from house to house, or adhere to the stools of cholera patients, which is said to be a main source of its propagation. It is well known that electricity can be produced by friction of the clothes, or, indeed, by any species of molecular disturbance, but who ever

heard of such producing cholera, or any other disease? The important fact that the excrements of cholera subjects are the principal sources of contagion, bears strongly on the probability of the poison being organic points capable of propagation. It may be asked, why could there not be minute poisonous atoms floating in the air, or deleterious unknown gases, which would thus poison the blood and cause disease? Doubtless such may be the case, but we must admit in epidemics such points or deleterious gases to be capable of propagation, otherwise the disease produced would soon terminate for want of cause, and if propagative, then they come under the definition either of organisms or propagative points of force.

There are three ways of poisoning the blood, resulting in disease or death, viz.: First, by fermentation caused by the inoculation or reception of bodies capable of producing such action; Second, by chemical combination with the foreign substance; and Third, by what is termed catalytic action. Fermentation is the breaking up of the constitution of the blood by organisms which feed upon some of its elements, thus separating into new compounds such portions as are acted upon; the ultimate of fermentation is putrefaction and dissolution. Some of the ferments are vegetable, and some animal; generally the decomposition of animal tissues is effected by infusorial animalcules, the smallest commencing the operation, viz.: the monas crepusculum, and bacterium termo, according to the researches of M. Pasteur, a distinguished French chemist. The size of these animated points is so minute that the smallest specimens imperceptibly fade away under the highest powers of the microscope, and are only known to exist at certain points by the slight movement of the liquid which surrounds them. Thus I have at first, in the sanguinious matter from an ulcer, seen only a kind of motion in the semi-liquid mass with a magnifying power of four hundred diameters, but with a careful increase of power and arrangement of light, I have detected countless thousands all in active movement. An idea has been attempted to be given of the relative size of these excessively minute organisms, by saying that thousands of them might sail side by side through the eye of an ordinary needle.

The poisoning of the blood by chemical combination with a foreign substance is well seen in cases of poisoning by arsenic or corrosive sublimate, which unite with the albuminous tissues or parts, and thus, rendering them solid, incapacitate them for further vital operations. This action of these two substances renders them virulently poisonous to all life, for every organized body contains albuminous compounds essential to its structure. Thus, arsenic, or chloride of mercury, in solution, when given in small doses, would completely destroy the malarial spoves or germinating cells, which may have been absorbed in the blood. The blood globules being larger, and hence supposed to have a larger amount of vital resistance, would not be sensibly affected unless the amount taken should be too large, in which case they also would be killed.

What is called catalytic action is the production of a certain effect in compound bodies, without any apparent change in the agent employed, and is probably an electrical phenomena. Thus a mixture of oxygen and hydrogen gases may remain perhaps indefinitely without change, but on the introduction of a clean piece of platina foil they immediately combine and form water. If a piece of metal be in the slightest degree electrified, it will cause the explosion of fulminate of silver. If the blood be inoculated by an organic poison, as that of the snake, an immediate action commences, and in a short time the vital force, as such, is destroyed. This species of poisoning is entirely distinct from that of fermentation or malaria, for whilst the latter find their proper field of action in a debilitated, nervous condition of the system, and consequent weak resisting power, the former acts with greatest energy when the nervous force is in best condition. Thus it is said to take less organic poison to destroy life in a vigorous organization than in a feeble one. In other words, the poison acts directly on the nervous and vital forces, and its action is in proportion to their energy.

This would seem to indicate a possibility that those forces could be so lowered in polarity, by being brought into contact with certain agents, as to change their nature or become transformed into others, just as light, heat, and electricity are corelative, or

capable of being converted the one into the other. The fact exists that the nervous and vital forces gradually disappear under the action of such poisons, and as it is held that no force can be lost under any circumstances, the question arises, what has become of them?

Alcohol, and the alkaloids, such as quinine, morphine, nicotine, etc., also appear to act directly on the nervous force; their first effects being stimulative, or increasing the energy of the nervous power, they would hence appear as the antidotes of the above kind of poisons. There must be floating in the air, in the neighborhood of localities favorable for their propagation, a number, more or less great, of minute animal organisms, the dead remains of which must be absorbed in the lungs, and there act in some measure like particles of putrid blood, poisoning the system. The same conditions, favorable for the development of vegetable organisms, would favor the production of such animalculæ, and hence attending malarial poison of the blood would be the organic poison affecting directly the nervous force. Hence, if arsenic, mercury, etc., be used to destroy the vegetable germs, then alcohol, quinine, morphine, etc., would be indicated as the proper agents to neutralize the action of the decaying animal germs; or, as the two kinds of poison probably prevail together, then a mixture of the two species of antidotes would suggest itself for malarial influences, such as doses of arsenic and brandy, or arsenic and quinine.

Arsenic, mercurial compounds, and the alkaloids, have long been employed as the proper remedies for malarial fevers, and it is interesting to trace out the chemistry of their use.

As regards the supposition that malaria and epidemics may be caused by organisms floating in the air, I will here quote the substance of the remarks of Dr. G. Robinson, in an address made to the British Association, 1863. The author alluded to the circumstance of the analogy between many of the phenomena of fevers and other zymotic diseases, and the ordinary process of fermentation having been perceived and recognized by Hippocrates and the oldest writers on medicine. Their idea was, that a poisonous ferment, existing in the atmosphere, entered the mass of the

blood, and induced in it a series of changes, which gave rise to the excessive heat and other peculiarities of that class of disease. At the present time, this doctrine, modified by the discoveries of Liebig, and other chemists, has been adopted by most physicians, and forms the basis of the classification of disease framed by Dr. Farr, and used by the registrar-general. It thus supposes living germs to exist in the atmosphere, which, when introduced into the body, give rise to a specific and regular series of morbid actions, pursuing a definite course in a definite time, as in small pox, those germs being disclosed and multiplied, and producing others capable of reproducing in other bodies the same succession of changes. (An. Sci. dis., 1864.)

I trust the foregoing remarks, however inadequate in elucidation, will prove suggestive, and assist in drawing attention to a subject of great interest to mankind.

ARTICLE III.

Remarks upon the supposed influence of the mother in the production of Nævi Materni, or congenital "marks," and other deformities. Read before the Medical Society of Augusta, August 1st, 1866. By L. A. Dugas, M. D., Professor of Surgery in the Medical College of Georgia, and President of the Medical Society of Augusta.

The love of mysticism and the vain desire to account for everything, have led men into some of the strangest vagaries with regard to the origin, or immediate cause, of those blemishes of the skin and malformations of the body so often observed in new-born infants. The most common interpretation of these "marks" is, that they result from the longing desire of the mother, during pregnancy, for some particular article of food, which article is thought to be faithfully represented by the blemish on the skin; and, as the color of these marks varies from a pink flush to a reddish brown, they are most frequently supposed to be pictures of strawberries, cherries, or other fruit; sometimes of roast beef, ham, etc. Other marks and malformations are attributed to the surprise or alarm of the mother at the sight of some hideous or frightful object during her pregnancy. The locality of the mark is said to be determined by the application of her hand at the time

to the corresponding part of her own body. Hence, the precaution recommended in such cases, to apply the hand promptly to some concealed part of the surface, in order that the mark of the child may be covered by his garments and not be unsightly. Woe be to the child if the mother carries her hand to her face when she is "longing" for a dish of strawberries, or is shocked at the sight of a toad, for the offspring will then be terribly disfigured! These superstitions are so generally known, and, I may say, believed, that it is unnecessary to enter into a more detailed account of them. Let us now examine the matter a little and see if there are any grounds for the belief, or rather if it be possible for such effects to be induced by such causes.

The only rational grounds for the belief are to be found in the occasional coincidence between the alleged cause and effect. But even these are so rare when compared with the countless number of instances in which the effect fails to follow the cause, that they must lose much of their force upon the slightest investigation. Hideous objects have been known to frequent the thoroughfares of London for many months without giving rise to a solitary well-authenticated instance of deformity in anywise resembling them, although they must have been seen by thousands of women, at all stages of gestation. A cause so rarely followed by any effect can scarcely be entitled to be considered as a spectacle carefully to be avoided by women lest the fœtus in utero be made to bear the marks of their temerity. Again, was there ever a woman who, under the influence of the derangement of the functions of the stomach, and the capricious appetite peculiar to pregnancy, did not, more or less, ardently desire some article of diet she could not obtain? And yet how does the number of children born with marks correspond to the number of those who come into the world without the evidence of such longing? This absence of sequence will become more striking if we bear in mind that inasmuch as the mother must have, in every instance, desired quite a variety of things, it can never be difficult to assign the mark to some object it may be supposed to resemble.

But science furnishes us the strongest argument against this superstition. The laws of fœtal evolution have been so successfully

studied during the present century, that we are now enabled to solve many problems heretofore incomprehensible, with regard both to the nevi materni and to the malformations or monstrosities, as they are technically called, which we occasionally meet. Among the principles that bear upon our subject, the following may be mentioned:

1st. That, with the exception of the heart and organs of digestion, the early product of conception consists of two lateral and symetrical halves, which subsequently come together and are agglutinated upon the median line so as to constitute one body.

2d. That the process of evolution proceeds from the periphery to the centre; those portions most remote from the median line being formed first and the others last. Hence, the fingers are formed before the hand, this before the forearm, and the arm proper still later; the ears exist before the eyes, these before the nose; and so also with regard to the trunk.

3d. That any arrest or cessation of evolution before it be completed must result in malformation, corresponding to the stage of evolution at the time of its arrest. If, for example, after the hand has been eked out of the body, the process of evolution be arrested, the child will be born with a hand where the shoulder should be, and consequently with neither forearm nor arm. If, after the formation of the ears, head, and eyes, there be no farther evolution, and the two halves become then agglutinated, the nose and the central portions of the upper-jaw will be wanting at birth. Cyclops are thus formed by the union of the lateral portions of the head just at the time when the outer half of each eye had been completed. The arrest of evolution leaving only one half of each eye formed, these halves have come together so accurately as to resemble one perfect eye on the median line. Cyclops can never have a nose, because of the arrest of evolution and of the union which has taken place before it could be formed.

4th. The failure to unite the two halves at any point of the median line must leave fissures where none should exist. Hare-lips and cleft palates are thus produced.

5th. Whenever two products of conception or distinct fœtuses become united during their evolution, the connection always

occurs between homologous parts; or in other words, parts dissimilar in the two never unite. Union takes place of face to face, back to back, side to side, sternum to sternum (as with the Siamese twins), shoulder to shoulder, etc.; but we never find the face of one united to the back of another, nor the shoulder to the hip, nor any union of parts dissimilar.

6th. The process of evolution may be excessive as well as incomplete; when excessive in certain portions of the capillaries, these blood-vessels, which are in the normal state too small to be seen with the naked eye, now become so large as to carry red blood and to impart to the locality (if in the skin) a corresponding degree of redness. This is the way in which marks are formed. An excess of evolution may also produce supernumerary fingers or other appendages.

With these principles in view, we must be prepared to admit that if the emotions of the mother ever affect the fœtus so as to induce deformity, this must be done at the precise time at which the deformed locality is undergoing evolution; for the difficulty would much increase if we had to presume that, after the evolution had been completed, the emotions of the mother would destroy it and reproduce an anomalous one in its place. In the case of hare-lip, for example, which is one of the simplest deformities resulting from a failure of timely agglutination of the parts, to suppose it to be induced by an emotion occurring after the formation of a healthy lip, would be to admit the possibility of a destruction of normal tissues and the extension of skin over the edges of the newly formed fissure.

One of the most hideous deformities, and one unfortunately too common, is that which results from an arrest of evolution before the development of the brain and cranial bones. The child is then born with neither brain nor head proper, while the face is fully developed, which gives it a monstrous appearance, not unfrequently compared to a toad or bull-frog. Would it not be taxing the credulity even of a fanatic in such matters, to suggest that any emotion of the mother could induce the destruction of such extensive and important organs after they had been formed? The cause, whatever it may be, which gives rise to such a deformity,

must be operative before the evolution of these portions of the body; for it clearly results from an arrest of evolution. I may be permitted here to cite an instance somewhat analogous, which was attributed by the accoucheur, a physician of high standing and of large experience, to the sight of a giraffe during the last month of pregnancy. The child presented a deformity of the head, which was said to assimilate it most strikingly to a giraffe. I requested permission to examine the monstrosity with the gentleman in attendance, and found it to be simply a case resulting from an arrest of evolution in the cranial bones; but not in the brain. The consequence was, that the hemispheres of the brain, not being bound down by bony matter, stood up somewhat like cones; and these were the bodies supposed to correspond to the ears of the giraffe! In all other particulars the child was well formed, and lived several days. Now, if the sight of the giraffe had had anything to do with this deformity, it must have occasioned the destruction of the whole scalp and of all the bones of the cranium in the course of the few weeks which elapsed between the unpleasant spectacle and the birth of the child. And yet it is probable that this wonderful effect will be handed down from generation to generation among the credulous friends who witnessed it, as positive evidence of the correctness of their belief! Almost every family circle hoards up some story of the kind, in which the most circumstantial details are given to establish authenticity; but although I have sought every opportunity to investigate the correctness of the inferences, I have never yet seen one which would sustain the belief in the slightest degree.

Is there any reason to believe that emotions of the mother's mind can affect the evolution of the fœtus in utero? This is an interesting question to physiologists, and one that has engaged their serious attention from time to time. In order to answer it, we must first determine the ways, or means, by which communication is established and kept up between the mother and the fœtus. There is between the two an obvious communication by means of the blood; for it is through the mother's circulation that the fœtus is nourished. The placenta is attached to the inner surface of the uterus, whence it continually derives nutritious blood from

the mother, and returns that rendered unfitted for this purpose by its course through the fœtal vessels. So far as the minutest anatomical investigations may be relied upon, there is no nervous communication whatever between the two. No nervous filaments have ever been found running from the uterus to the fœtus. I believe that some anatomists have imagined that they traced nervous filaments into the placenta, but I can just now recall none who pretend to have followed them any farther. In the present state of our knowledge, we can not admit that there exists any other than a sanguinious communication between the mother and fœtus; and this seems to be all that is necessary for the well-being of the product of conception. If analogy be worth anything in settling such questions, we should observe that in oviparous reproduction all communication is cut off as soon as the egg becomes encased in its shell. The chick is nourished and developed at the expense of the pabulum enclosed in the shell. This yolk, or pabulum, having been supplied by the mother in sufficient quantity, all communication is cut off, and with it the nervous influence, if any previously existed. It should also be remarked that malformations are exceedingly common in our domestic fowls, and that they occur in strict accordance with the principles we have adduced as governing them in the human family.*

In conceding that the fœtus in utero derives his nourishment directly from the mother's blood, it follows that the development of the fœtus may be influenced by the quality of the food supplied. But, while this might affect the development of the body as a whole, it is not easily understood how it could affect only certain localities, and, still farther, do so under the temporary influence of a desire for special articles of diet, or of a sudden emotion, however strong. A mother pining away under protracted derangement of the functions of digestion, or long-continued grief, which might likewise impair her functions of nutrition, might give birth to a puny child; but this does not reach the cases under consideration, in which the defects are altogether local.

* The Medical College of Georgia contains a very valuable collection of monstrosities, not only human, but also representing nearly all our domestic animals. In every instance, whether of single or double monsters, the same laws are observed, and the deformities of the lower animals correspond exactly to those in the human subject. Will it be urged that the mental emotions of the hen, the cow, the mare, the sow, etc., have occasioned these modifications of development in their young.

Indeed, it is generally found that those who are born with malformations, referred to an arrest of evolution in a certain locality, are rather prone to an excess of evolution in the unaffected parts of the body.

Finally, if the mental emotions of the mother ever reach the fœtus, this must be done through the nervous system, which can alone convey them from the brain. We know of no other channel through which the operations of the brain may be conveyed to the other parts of the system. It is through them that the brain receives the impressions made upon all parts of the organism, and it is likewise through them that the mandates of the will are transmitted to every muscle of voluntary motion. If there be no nervous communication between the mother's brain and the system of the fœtus, and none has ever been detected, is it not preposterous to attribute an extensive and most curious class of phenomena to the influence of the mother's mental condition upon the intra-uterine offspring?

There is no denying the occasional occurrence of coincidences well calculated to impress the unreflecting classes of society with a belief in the superstition we are combatting. The case I have cited, in which the sight of the first giraffe that was brought to this city was followed by the birth of a child deformed in that particular manner, carried conviction to the mind of those who may have doubted before; and especially when sustained by the credulous accoucheur. It is probable that any other deformity would have met with the same interpretation in that case, for the menagerie contained quite a large collection of wild beasts, some one of which would have supplied the place of the giraffe if this had not answered the demands of the imagination. If the child's skin had presented a number of marks, the leopard might have been made to father them.

I saw another striking case of coincidence, which occasioned quite as much sensation as the one referred to. I was requested to visit a little negro who was suffering with paraphymosis, attended with retention of urine, and was waited upon by a negress in her last month of pregnancy, who assisted me in drawing off the urine with a catheter and in reducing the strangulation.

About a month after this a messenger came for me, stating that this woman "was delivered the night before of a son who was affected just as the other little negro was, and could not pass his urine." I found accordingly that the new-born infant had a fissure of the prepuce, resulting from an arrest of evolution, and an occlusion of the meatus urinarius by mucous agglutination, which prevented the escape of his urine. The meatus being opened with a probe, the urine was immediately passed off. Nothing could be more conclusive, and it is needless to add that no argument I could adduce had the least influence in shaking a faith so strongly confirmed. And yet, in this case, the fœtus was eight months old when the unpleasant sight was witnessed; his genital organs were then, of course, fully developed, or rather deformed, in the way in which he came into the world. If they were not deformed at eight months, how could they become so at a later period? The history of dreams, and of coincidences in general, is full of curious and inexplicable facts, which we must admit, but which we should be careful not to invoke in support of superstitions entirely at variance with sound knowledge and subversive of all we know to be true.

We are now prepared to understand the philosophy of the simplest, as well as of the most complex, deviations from the normal evolution of the body; and if we can not fathom their remote or ultimate cause, the reason is to be found in the law of nature which fixes a limit to our understanding. We know the ultimate cause of nothing whatever. Why does an apple fall to the ground? Newton has discovered the *law* by which this is effected, and answers that it is attracted by the earth. But why is it attracted? We can go no farther. The discovery of the law is the limit of our abilities. We are continually asked why it is that one person is born with blue eyes and another with black; why is one person fair and another brown; one with good teeth and another with bad ones! We know the laws by which all these peculiarities are brought about, but can not divine why these laws have thus controlled the evolution of each individual so as to make it different from others.

Nævi materni may involve the blood-vessels, the pigment coat,

and the hair follicles separately, or jointly, and be slightly raised above the general surface, or not at all so, giving very different appearances to the "marks."

When the blood-vessels of a certain part of the skin are in a state of hypertrophy, or of excessive development, the "mark" presents various hues of red from a slight flush to crimson, according to the different degrees of hypertrophy and quantity of blood there concentrated. These marks are more florid in the Spring and Summer, when the cutaneous circulation becomes more active, which circumstance is attributed by the vulgar to the relation the marks bear to certain fruit which ripen and turn red at that time.

Although this condition of the blood-vessels usually remains stationary after birth, instances are not rare in which, if not excessive, it gradually disappears. I have seen a number of children born with slight florid marks on the face, which entirely disappeared in one, two, or three years, without any interference. Sometimes they are cured by the supervention of some disease. A child a few months of age was brought here from the country with quite an extensive red nevus of one side of the face and lips. A surgical operation was proposed for its destruction, which I opposed, because of the danger it involved. The child, fortunately, escaped the ordeal, and was taken home. Not very long afterward, the whole face became invaded with crusta lactea, which ran its usual course, with the exception that it was worse over the nevus than elsewhere, and left the child completely relieved of her congenital deformity.

But sometimes the hypertrophy goes on increasing after birth, or may begin to do so in the adult, so as to result in a very formidable disease. They occasionally degenerate into malignant affections more or less unmanageable.

An excessive or perverted action of the pigment coat, by which the coloring matter of the skin is secreted, will produce patches more or less dark; and if the hair follicles are also affected, these marks may be covered with a more abundant growth of hair than the adjacent surface. An arrest of the evolution of the pigment coat in the whole skin of a negro will make him an albino. White rabbits, white mice, white crows, etc., are all produced in like

manner; and it is curious that in all these cases the coloring matter of the eyes is equally wanting; hence the intolerance of light, with which they suffer.

In some cases we find the development of the hair growth to be excessive and general. The hirsute woman and children, who exhibited themselves throughout our country some years ago, were striking instances of this kind. Simply bearded women are more common.

Harelip and cleft palate we have seen to be dependent upon an arrest in the union of the lateral portions of the body before its completion. This occurs occasionally in the spinal column. The whole, or only a portion, of the posterior surface of the spinal canal remaining open, the watery fluid, which fills the membranes by which the spinal marrow is surrounded, accumulates. As these membranes are not supported by the usual bony walls, they gradually yield, until they form a large pouch projecting from the affected region, and give rise to considerable deformity. This is what we denominate *spina bifida.* It is not only a malformation, but a frightful disease, which goes on increasing, and is necessarily fatal.

I have already noticed some of the most striking cases of deficient evolution in the brain, cranium, and scalp. Children may be born with imperfect hands, feet, and limbs; sometimes without any at all.

The most curious monstrosities are those which result from the union of twins. In the case of the Siamese twins, so generally known, it seems that their development went on naturally and separately until they were brought in such close contact that they adhered or grew together just at the lower end of the sternum or breast-bone. Why did not the sternum of the one adhere to some other part of his brother? Simply because the *law* which governs such cases forbids it. Instances are on record in which twins have been thus cemented by the soles of their feet, others by the crown of the head, some face to face, back to back, side to side, etc. In all these cases the individuals were at one time separate and distinct, and the subsequent union does not obliterate their individuality, however great may be the apparent fusion of

both into one. *Ritta Christina,* extensively known in Europe, had two heads and necks, four arms, and only two legs. From the umbilicus down there appeared to be but one child—a well formed girl. While one head was asleep, the other might be awake and playful, or crying. They lived upward of a year, when one of them sickened and died; the other, in good health until then, gasped and died, also, immediately. A post-mortem examination showed that their brains, spinal marrows, and nerves were distinct; that they each had a heart, but that these were inclosed in a common sac, or pericardium; that the digestive organs were distinct down to the large intestines, where they became merged into one canal. It was thus explained why their appetite was distinct, whereas their desire to defecate was common or simultaneous. Pain was perceived by the right head when the corresponding leg was pinched, and by the left when the same impression was made upon the other limb. Now, what had become of the missing portions of each body? They were absorbed or destroyed by the pressure by which the individuals had been forced together, when the tissues, being in a soft and almost gelatinous state, would readily lose their vitality.

Sometimes the pressure operates unequally upon the two beings, and results in the destruction of a very large portion of one body while the others have not suffered. We then have fragments of one body attached to another, which is otherwise well-developed. A cow was to be seen in our streets for a number of years who had the fore-leg of a twin dangling from her shoulder. It is remarkable that in all these cases the fragment, however large or small, obeys the law already enunciated, and unites only to a corresponding portion of the body of the other.

Having already extended these remarks far beyond the limits I had intended, I will conclude by urging upon the members of this Society an unbiassed and philosophical examination into every case that may present itself of supposed maternal influence upon the production of defective or anomalous evolution. A well-kept record of such investigations would be exceedingly interesting, for it is only by the collection of facts that we can ever expect to demonstrate the fallacy of the popular belief on the subject.

ARTICLE IV.

Penetrating Wounds of the Knee-joint: treated at Chimborazo Hospital, Division No. 2, Richmond, Va. By S. E. HABERSHAM, M. D., Surgeon in charge, and Vice President of the Medical Society of Augusta, Ga. Read before the Society July 18th, 1866.

The object of this paper is to call attention to the results of conservative surgery in gunshot wounds of the knee-joint, treated at Chimborazo Hospital, Division No. 2, hoping that it may induce other surgeons who may have the records of their own experience, to publish them in vindication of the Southern medical man, whose labors in the late sectional war should be a part of our glory, and of which we shall be robbed, if their names remain buried in the oblivion of private case-books. This mode of publication is the more important, since all of the carefully-prepared records in the C. S. Surgical Bureau were entirely destroyed by fire on the 3d of April, 1865.

The number of cases here reported are too insignificant for the purposes of statistics, yet they serve to show that, under favorable circumstances, many wounds heretofore deemed cases for amputation or resection may recover under the existence of favorable conditions, to be mentioned hereinafter; and though the writer does not presume to take issue with the eminent authorities and advocates for operative interference in all cases of gunshot wounds of this joint, yet he must believe that this rule will be somewhat modified when the results of Confederate surgery are published to the world, which can only be done through the voluntary contribution of every surgeon who has matter in his possession. Already has the result of conservative surgery in compound fractures of the femur somewhat, materially shaken our faith in the application of European experience to this country, and the number of recoveries from wounds of the knee-joint in all the divisions of Chimborazo Hospital, if they could be obtained, would throw valuable light upon a question requiring farther elucidation, before we can subscribe to the rule laid down even by Dr. Hamilton, an American surgeon, who says: "Gunshot wounds involving the knee-joint demand amputation in

almost all cases. Guthrie has seen no recoveries from gunshot wounds of the knee-joint, unless the limb was amputated. We have seen a few recoveries, especially when the joint was penetrated by round balls, or when the joint was slightly *opened.*"

Against secondary or intermediary amputations we certainly put in our demurrer, when the joint is simply perforated by the ball, or is within reach of the bullet forceps, and can be extracted without opening the joint too effectually. In support of which opinion the following cases are submitted.

Before, however, introducing these cases, it will be necessary to make a few preliminary remarks upon the hospital in which these results occurred, nor is it deemed irrelevant to the subject to consider the material of which the medical staff was composed, as explanatory of the cause why conservative surgery prevailed to so great an extent as it did in the early part of the war. Many of the surgical staff were called from the peaceful practice of their profession in small country towns, where operative surgery was seldom practiced, and when necessary, the more experienced city physician was generally consulted, hence it was very difficult for these men to bring themselves to realize the full force of the necessity of amputation, when the external appearance was simply a small slit, or circular hole in the skin, therefore many operations were postponed which, by the rules of art, should have been performed primarily on the field. In many cases nature was allowed to do her part unaided, save by such means as placing the patient in as comfortable a position as possible, the maintenance of secretions, regulation of diet, and removing such foreign bodies as presented at the orifice of the wound. Under this treatment, with careful nursing, many wounds of the most serious character manifested decided tendencies to recovery, so that the secondary operation was postponed from day to day until there was no question of ultimate recovery. On the other hand, there were those of more operative skill and experience in surgery who, appreciating the advice of military surgeons being on hospital duty, were generally obliged to wait for the secondary period or condition before amputating, and when this condition was obtained, it was deemed by them safe to subject the patient to conservative treatment, rather than expose them to the almost

certain death which attended intermediary and secondary amputations in hospitals. Experiencing the same beneficial results of postponement, they, too, became the advocates of conservative surgery, particularly when compared with secondary amputations. In time this influence extended to the field surgeon, who often, forced to reserve many cases "for a more convenient season," only operated upon those manifestly requiring immediately his attention, giving the others the benefit of a doubt, which often resulted in good to the individual, and saved, to many, useful limbs.

In a short time the experienced physician became an excellent consulting surgeon, and before the war terminated I doubt whether there could be found, in any army, more judicious, experienced, intelligent, and successful practitioners than was the surgical staff of the Confederate army; and this the records of the staff would show, could they be recovered from the ashes which has buried for ever, I fear, these herculean labors, excepting when here and there a few isolated cases may be published from the private records of individual surgeons. In no department of the staff would this have appeared more honorably than in the compilation of reports made by that intelligent and industrious officer, Surgeon F. Sorrel, General Inspector of Hospitals, and his able and hard-working assistant, Surgeon Baehr, which, but for the untoward accident of fire, would have enriched the field of military surgery, particularly in data on the subject of the conservative treatment of gunshot fractures of the femur and penetrating or perforating wounds of the knee-joint. Could these records be exhumed from the ruins of the War department, and published to the world, the Confederate medical staff, with its able, working, and discriminating Surgeon-General, would stand out as lovers of their profession and their race, contending against disease and wealth with all their energies, while the resources of their art were cut off by the cruel policy of the Federal Government, which declared *medicines* contraband of war, so that it was often, even in hospital, impossible to obtain a single dose of morphia to relieve the most excrutiating pain. This, however, is no place to recall painful associations, and this is only mentioned here to show one of the many difficulties we had to contend against in the treatment of the wounded.

Situated on the eastern confines of the City of Richmond, upon a plateau of ten acres (at least one hundred and fifty feet above the banks of James river), terminating in a precipitous bluff on the east, south, and west, and on the north in a wide cultivated field, the site of Chimborazo hospital possessed all the advantages of an eligible location. In addition to this favorable site, cool, stiff breezes from the southeast, coming across a wide river and immense extent of field and woodland, continually wafted the contaminated atmosphere of the hospital into the fields beyond, while many springs of cold, pure water, of 58° or 60° Fahrenheit, gave an abundant supply of nature's most refreshing and healthful beverage, so essential to the modern surgeon, and which has altogether supplanted the fomitic poultice in military surgery. With ample room for the accommodation of our wounded, we were generally enabled to give each patient from eight hundred to one thousand cubic feet of atmosphere, and when a purer air was deemed essential in any particular case, our wounded were isolated in tents, furnished for the purpose by the admired foresight of the Surgeon-General, which were pitched in open areas, in proximity to the hospital. The beneficial influence of this change was often manifested in the rapid improvement of gangrenous wounds, and sloughing phagardena.

During the battles around the city in 1862, many of the wounded were transported to the hospitals directly from the field, in private carriages, comfortable hacks, and ambulance wagons, and being immediately attended to upon their reaching the hospital, were thus placed under the most favorable conditions for recovery. Some cases, however, reached us in a moribund condition, having never recovered from the shock of the wound, while others, quite numerous, were transported long distances by rail or ambulance wagon, and consequently suffered the unavoidable neglect incident to the transportation of large numbers of wounded without a sufficient medical staff to afford them proper assistance. This evil helped to swell the mortuary report of the hospitals to a greater degree than any other cause, for it is certain that many wounded lost their lives who, under more favorable conditions of transportation, would have recovered.

The abundant ration supplied to the army of Northern Virginia

in the first year of the war contrasted very greatly with that of the period following the retreat of General Johnston from Manassas, and the subsequent operations upon the Peninsula, around the City of Richmond; in consequence of which, the soldiers brought into hospital manifested a decided tendency to all the diseases growing out of an impoverished state of the blood, such as scorbutis, purpura, sloughing ulcers, etc.; hence, wounds seldom manifested highly inflammatory complications, but on the contrary, the reverse, requiring a tonic diet and stimulating beverages in the outset to bring about sufficient action to resist the wasting and prostrating effects of suppuration. Thus the advantages derived from the favorable condition of the hospital, and the early removal of our wounded from the field-ambulance, were very much counteracted by this evil of spare diet requiring the utmost attention and discrimination in the attending surgeon, whose supply of stimulants was very meager, and generally confined to impure new whiskey, with an occasional bottle of brandy, reluctantly furnished by the medical purveyor, who, I suppose, had very little in store.

Now, that the war is over, and we are enabled to contrast our difficulties with the immense advantages enjoyed by the Federal surgeon in his superior resource and unlimited supply of every necessity, nay, every comfort for his wounded, the wonder is that our results of treatment should compare even favorably with theirs, and yet in several characters of wounds the credit would be in favor of Confederate surgery.

In no character of gunshot injury was unexpected success more manifest than those included in the following summary and history of cases:

Total number of cases admitted from July, 1862, to April, 1865, 25; known to have recovered, 6; furloughed, but not heard from, 3; transferred as convalescents, 4; unaccounted for, 3; died in hospital, 6; in hospital April, 1865, recovering, 3.

We have, in the above summary, a known mortality of six cases, or twenty-four per cent. Suppose, however, of the three furloughed but not heard from, four transferred as convalescents, and three unaccounted for, twenty-four per cent. died, we then have in

all a mortality of nearly twenty-seven per cent.; the three, however, who were furloughed were certainly in a fair way of recovery, else the board would not have acted in their cases; the three unaccounted for may possibly have died, though this is not probable, else the fact would have been mentioned in the copy of surgical reports. It is, therefore, more probable that they were transferred to some country hospital, and in the hurry and confusion attending some of these transfers (of a hundred men at a time, in a few hours after receiving the order), the clerk may have omitted to mention the fact in the copy of report. But, even if we allow among the two above enumerated the twenty-four per cent. of deaths, we have a most favorable result, very much at variance with the statistical records of all previous surgical experience, and mainly attributable, no doubt, to very favorable hygienic influences in the hospital; the persistent and judicious use of cold water, and the tender care manifested for the sick and wounded by our valuable matron, Mrs. Pember, who spared no pains in the preparation of the diet prescribed for them, often supplying from her own stinted resources the deficiencies of the supply furnished by the hospital department and city market.

Case 1.—Penetrating wound of knee-joint, by conical missile, causing pyemia and death.

I. P. B., private Co. I, 2d S. C. infantry, was wounded on the 2d July, 1862, and admitted to hospital on the next day, with wound on external side of left knee; synovia escaping; ball extracted; no fracture detected; a high degree of inflammation resulted in profuse suppuration, and pyemia terminated the case in a few days.

Case 2.—Penetrating wound of knee-joint by conical missile. Pyemia; death.

T. B. S., Co. —, 2d N. C. regiment, wounded June 28, 1862, and admitted 30th, with penetrating wound of joint; synovia escaping; no fracture detected; missile lodged, but not discovered. Synovitis supervened on third day of receipt of wound, and pyemia terminated life on the 11th July.

Case 3.—Penetrating wound of knee-joint; synovitis, terminating in gangrene; amputation and death.

W. P., Co. A, 34th N. C. artillery. Wounded June 27th, admitted June 29th, with penetrating wound of knee-joint by conical missile, fracturing patella, and lodging. Health good, and quite an athletic man. At the time of admission there was so little appearance of even external inflammation that it was thought to be a glancing shot, confirmed by the statement of the soldier that he had walked a mile without much pain after being wounded. On the fifth day of admission synovitis supervened, and, on consultation with surgeon McCaw, amputation was determined upon, it having been discovered that the head of the tibia was fractured. On the 9th day of July, free suppuration having been established, and the patient being in a proper condition for secondary amputation, it was determined that the operation should be performed in the cool of the afternoon. In an hour or two the wound was attacked with gangrene, implicating the whole surface of the knee, and amputation was performed before the prescribed hour, by Assistant Surgeon Wall, the patient not losing more than two or three ounces of blood, notwithstanding which, he commenced to sink in a few hours after the operation, and died on the sixth day after from suppurative discharge. An examination after amputation revealed fracture of head of tibia, with injury to external condyle of femur.

This was the first case of true malignant or hospital gangrene that occurred in the second division of Chimborazo hospital.

Case 4.—Wound of the knee-joint by fragment of shell, opening synovial sack and grazing external condyle of femur. Recovery.

I. S. N. private Pegram's battery, aged 19. General health good. Wounded May 24, admitted next day. Wound by small fragment of shell, which entered at external edge of patella, grazing external condyle of femur, and making exit through quadriceps tendon, with escape of synovia from lower wound. When admitted, patient was suffering much pain, and the knee was much swollen from synovitis. The limb was immediately elevated on pillow, cold drip applied, and one quarter-grain tartar emetic prescribed every two hours, until nausea occurred, then reduced to one eighth-grain every two hours, or, in case this should nauseate, to one sixteenth-grain. The former was suspended sometimes for a few hours, and the latter occasionally omitted.

Tenth day. Inflammation subsiding; complains of drip—use wet rags instead; tartar emetic suspended.

June 6. Discharge of synovia ceased; lower wound granulating on edge; discharging serum as if from joint; upper wound healed, covered with white film.

June 16. Lower wound healed. Some enlargement of knee, with pain upon motion; some slight inflammation has occurred; return to cold drip.

June 18. Cold drip having proved uncomfortable, was suspended after a few hours trial, and wet rags substituted; knee natural in temperature; no pain upon slight motion of limb.

June 24. Patient being anxious to be on his feet, suspended his leg by sling, passing under foot and around neck, and permitted him to walk about the ward for a few minutes.

June 26. Patient brought before furlough board, and sent home for sixty days—in charge of a friend.

Case 5.—V. S. left knee-joint, by conical missile, entering an inch below outer side of patella, passing into joint and lodging against integument on its inner side, from which it was removed, with one or two spiculæ of bone, by incising integument.

W. H. S., aged 23, Co. B. Pegram's battery. General health good; was wounded 24th May and admitted into hospital the same day. Knee very much enlarged; inflamed and very painful, with profuse discharge of synovia; high inflammatory fever; limb was elevated on pillows and cold drip applied; tartar emetic as in other case every two hours, and diminished according to effect; half-grain sulph. morphia at bedtime to insure rest and benumb pain.

May 26. Knee not more enlarged; external inflammation greater; synovial fluid still escaping from both wounds; synovitis acute. Continue cold drip; canteen to be frequently filled with fresh water from spring; continue tartar emetic. Ten grains calomel, to be followed in six hours by half-ounce sulph. magnesia in eight ounces water.

May 28. Wound attacked with erysipelas; removed to tent; suspend cold water; paint with tinct. iodine; stop tartar emetic and substituted twenty drops mur. tinct. iron three times a day, in

half-tumblerful of water; half-diet. This treatment was continued for fifteen days, when the erysipelas had subsided and patient was returned to his ward.

June 26. Discharge from joint has altogether ceased; wound of exit showing tendency to heal; slight constipation, indicating saline aperient; continue wet-rag application, which had been used constantly after return to ward; full diet.

June 30. Patient unusually cheerful upon promise of furlough; pulse natural; temperature of joint natural; sleeps well, and eats his full ration.

July 6. Swelling of joint nearly reduced; inner wound nearly healed; outer one discharging dark-colored serum; continue full diet and water dressing.

From this time there was a gradual improvement, terminating in recovery, with stiff joint, and he was furloughed by board some time in July not stated, for sixty days. When he left hospital, joint was nearly of natural size.

Case 6.—V. S. left knee, by conical missile, entering on the outer edge of patella, making exit at centre of politeal space, with escape of synovia from both orifices, and recovery, with stiff joint, in forty-nine days.

J. F. F., aged 25, private Co. B, 47th cavalry, was wounded May 7, 1864, and admitted into hospital on the following day, with joint very much swollen, a deep inflammatory blush around articulation, and particularly wound of entrance. This wound was accompanied with great pain. The patient was of strong constitution, in perfect health, and appreciated fully the danger of the wound and the necessity of obeying implicitly the directions given to his nurse. The limb was elevated upon a pillow, the cold drip immediately applied, and continued unremittingly for fifteen days, affording the patient so much comfort that he was able to attend to it himself. On the fifteenth day a pustular eruption appeared, covering the joint, no doubt the effect of the continued use of the cold drip. This eruption resembled that produced by tartar emetic ointment, and was extremely painful, attended with the most intensely itching sensation. Upon the

appearance of this eruption, the swelling of the joint immediately subsided, and wet-rag applications were substituted for the drip; synovial discharge ceased.

May 28. Wound healed; swelling of joint nearly absent; pustular eruption discharging, showing no tendency to resolution, and still quite painful; continue cold water application; full diet; patient having been on half-diet.

June 13. Eruption disappearing; nearly absent; joint nearly natural in size, but stiff.

June 21. Patient perfectly recovered, with stiff joint; furloughed by the board for sixty days.

This patient reported at expiration of his furlough with stiff joint. The revulsive effect of the eruption in this case, no doubt, expedited recovery. It will be seen that the continued use of cold water was the only remedy used; that he was only on half-diet for twenty-one days. When he appeared before the board he presented the appearance of perfect health.

Case 7.—V. S., left knee by conical missile, which entered at inner edge of patella, passing into joint, comminuting end of femur and lodging in popliteal space against integument; was removed by incision on the field. Escape of synovia from both orifices; death in fifty-three days after receipt of injury.

J. O., private Co. G, 11th Va. infantry, of scrofulous tendency and leuco-phlegmatic temperament; was admitted on the 8th May, 1864, having been wounded three days before; was suffering much pain in joint when admitted, which presented all symptoms of acute synovitis and joint greatly enlarged; pulse full and rapid. This patient expressed great anxiety as to the result of his injury, and seemed to have a fixed presentiment that he would never recover. The cold drip was applied and the limb supported on pillows. Full doses of morphia, to allay nervous excitement and produce sleep, and the patient assured of his recovery, to allay mental inquietude. Here I would remark, that this fixed presentiment of death is almost a certain indication of an unfavorable termination, even in slighter wounds than this, acting upon body as well as mind, he is left without hope to sustain the body in its struggle to repair the injury.

Sixth day of admission. Profuse hemorrhage from upper wound, easily arrested by elevation and ice applied to the wound. Notwithstanding every means used to subdue inflammation, it did not begin to subside for some days, when profuse suppuration set in, and incisions were found necessary to give exit to pus in joint, which flowed in enormous quantity, and subsequently burrowed along the thigh, from which it was discharged by incision also. As no means seemed to exert any influence in postponing the termination of this case in death, I will simply state that the patient died from exhaustion on the 27th June.

In the treatment of this case, Smith's anterior splint was used, and found to add very much to the comfort of the sufferer.

Case 8.—V. S., left knee, by conical missile, which entered the joint one inch above and external to patella, passing out at flexion of joint near centre of popliteal space. Recovery in one hundred days.

W. H. U., private Co. E, 17th Va. infantry, wounded May 16, and admitted into hospital on the evening of the same day. Joint much swollen and very painful, also profuse discharge of synovia from inferior orifice of wound; cold drip applied as in other cases, and patient put upon light diet, which treatment was continued to the twenty-sixth of May, when, from the peculiar appearance of the discharge, seemingly an intimate mixture of pus and synovia, and the great enlargement of the joint, it was thought advisable to incise lower wound to give exit to pus. None, however, flowed, for the discharge was of so tenacious a character as to block up the incision as well as the superior wound. The general health of the patient being very good, it was resolved, upon consultation with the attending ward surgeon, to wait a few days and see the result before incising again, and the wet-rag application was continued, the limb being placed on its side.

May 30. Appearance of joint unchanged, excepting slight diminution in size; cold having proved disagreeable, warm water was substituted for a few days, but a tendency to increased inflammatory action induced us to return to the cold water dressing, with small, not nauseating, doses of tartar emetic. It was not found necessary to incise the joint again nor to suspend the cold water dressings

during the progress of the case. Tartar emetic was discontinued in twenty-four hours. Gradual improvement in joint commenced about the 10th June and continued until the 25th day of September, when he recovered with anchylosis, and was furloughed for sixty days, but never returned to hospital.

Case 9.—V. S., left knee by minnie missile, fracturing head of tibia and making exit near external condyle of femur. Death from pyemia.

W. G. H., October 24, private Co. K, 44th Va. infantry. General health good; wounded February 6, 1865, and admitted February 9. The only record found of this case is, that the wound was very painful, discharging synovia freely; prognosis unfavorable; should have been amputated on field; died March 14, of pyemia.

In connection with this case, which is only introduced to call attention to the character of wound, viz: Fracture of the head of the tibia, and the remark of the attending ward surgeon, "should have been amputated on the field," I would remark that this complication was considered necessarily fatal.

In the summary and above history of nine cases, are included all the knee-joint wounds admitted from the 28th June, 1862, to the 3d of April, 1865, and I regret the loss of a second volume of manuscript, containing the history of the remaining cases from which the summary is drawn, precludes the possibility of my continuing the history of the cases.

The three cases unaccounted for were admitted during my absence on a sick leave of two months, consequently no notes were taken in their cases, and they simply stand upon the register as admitted with penetrating wound of knee-joint, and some other insignificant data. Even the fact of their transfer is omitted, and the probability is, that they were so disposed of, since their deaths would certainly have been mentioned. At the time of my absence, the exigencies of the army called for a large number of assistant surgeons, and it so happened that most of the officers attached to the second division were those selected, while contract physicians were substituted, who knew nothing about the routine duties of the hospital. Coupled with this evil the clerk, whose duty it was to attend to the hospital register, having no one to overlook him, neglected his duty, and

finally deserted,* and then much valuable data was lost which might have been collected under other circumstances. Enough, I trust, however, has been shown in the above nine histories of cases to elucidate the character of injury for which we claim the benefit of conservative surgery.

When it is recollected that irritative fever and inflammation set in sooner in wounds of the knee-joint than in any other cavity, excepting the lungs, that gangrene sometimes terminates the life of the patient within five days of the receipt of the wound, the necessity of prompt action on the part of the field surgeon is manifest, and therefore the great importance of fixed rules, from which there should be no departure, inasmuch as a few hours' delay might result in irreparable injury to the individual and render nugatory all the advantages of conservative surgery.

The hospital surgeon, who sees all of the above-mentioned evils when too late to remedy them, and has learned too well the danger of secondary amputation, or the long suffering and ultimate termination in death of a badly selected case for conservative treatment, as was that of Oliver, No. 7, is probably the best judge as to the character of wounds likely to recover under favorable conditions, and therefore the greater the importance to be attached to his opinion upon this class of injury.

The deductions drawn from histories of cases, by others, are not to be compared in value with those convictions resulting from a personal familiarity with the cases, and studying them from day to day through the many phases of conditions likely to occur in their treatment. I, therefore, trust that if, in suggesting the following rules for amputation, there should appear aught of egotism, it may be attributed to a desire to give the results of individual experience and the opinions deducted therefrom, rather than the dogmatical expression of an idea, which the observations and experience of others may falsify. It is, therefore, with the hope of being corrected, if wrong, that I am induced to offer the following rules for amputation in this class of injury:

* These remarks, of course, do not refer to Mr. W. Walker, of Virginia, who remained at his post to the last day, and to whom I am indebted for valuable clerical services.

1st. That amputation should be promptly performed in all those cases attended with laceration of the soft parts surrounding the joint, and opening the synovial sack, or where the tibia or condyle of the femur are either of them fractured. We say nothing of the graver injuries to the joint, for here, as in the case of lacerated wounds, the indications are too palpable. The patient should have the advantage of conservative surgery, if the wound is simply a penetrating or perforating one, grazing either of the condyles, but the grazing of the head of the tibia is of more serious import, necessitating amputation wherever it occurs. If the wound, then, is simply a perforating or even penetrating one (providing the missile can be extracted), and has not grazed the head of tibia, or fractured the entire condyle, an effort should be made to save the limb. When this is determined upon, the limb should be put in a splint, as for fracture of the thigh, leaving the joint uncovered, the object being to prevent the least motion in the articulation. Any of the ordinary dressings may be used to the wound during the transportation of the wounded man to the hospital, and the injuries of this class should always be accompanied by a proper attendant, to see that the physical comfort of the patient is attended to, and that the irritating tendency of the wound is not aggravated by motion of the limb or the want of ordinary dressings during the journey. Opiates should also be given to benumb sensibility, for of all wounds these are the most painful. If the above conditions obtain, and the patient be of sound health, and not of strumous or cachectic habit, an effort to save the limb will probably be attended with success, but the case will require the utmost attention on the part of the surgeon and nurses.

As to the treatment to be adopted in these cases, this must be left to the judgment of the attending surgeon, who alone can decide upon the indications of the case, which may arise from day to day. He alone can determine when to use the cold drip, or when to substitute the simple cold water dressing for it; when to administer anodynes and when to withhold them; when to administer sedatives, such as tartar emetic, and when to incise. Hence, no one, however great may be his experience, can lay down any fixed rule for treatment in individual cases, and in the opinion of the writer, that

surgeon who advocates free incision of the joint as a preliminary to treatment is in error, as such a proceeding was never instituted by any of the surgeons who had charge of the cases included in this article.

The writer was induced to suggest the use of tartar emetic, as adopted in some of these cases, from the very favorable influence it has seemed to exert in arresting paronychia and pereostial inflammations generally. In none of the successful cases were the joints ever entered by probe or finger after admission to the hospital, it having been taken for granted that the field surgeon had done his duty in this respect; consequently, we could only be guided by the direction the ball had taken, as manifested by the wounds of entrance and exit, the escape of synovia, the appearance of the ball (whenever in possession of the man), and the escape of spiculæ during treatment, in forming an estimate of the amount of injury inflicted.

In the local treatment of highly-aggravated inflammation, I have never had the objection to cold water common to many surgeons of much greater experience than myself, for the reason that I have always found it the most powerful means of controling local inflammation when constanly applied. In those cases where it has done harm, for I have seen many such, it was either applied too soon, thus keeping down a healthy reaction in the part, thereby causing sloughing or mortification, or had been continued too long after the subsidence of inflammation. In either case the same result should have been anticipated, since by its means the vitality of the part had been kept too low for healthy suppurative action.

For information upon this subject, the reader is referred to some very judicious remarks of Surgeon Reid, in an article upon wounds of the large joints, published in the present number of this Journal, and which was read by him before the Association of Army and Navy Surgeons in Richmond. This very able paper is replete with valuable information pertaining to the subject, and comprehends everything which can be said on wounds of the knee-joint.

If, in presenting the above history of cases, the writer should be instrumental in eliciting other contributions upon this subject, he will feel amply repaid for any trouble its preparation has given him, in the consciousness of knowing that he had added his mite of

information to the treasury of knowledge, and that the little light he has been able, by its means, to throw upon the subject of Confederate surgery, has not been hidden under a bushel.

The gentlemen immediately connected with the treatment of most of the above cases, to whose skill and unflagging energies the happy results may be attributed, were Assistant Surgeons Harrison, Vaidin, and Upham, of Virginia; Wall and Saball, of Florida, and several other gentlemen who were connected for a short time with the division. I was also indebted for much valuable advice, in consultation, to Surgeon Seabrook, now of Richmond, Va.; Holloway, Professor of Surgery in the Louisville School of Medicine (Kentucky), and Surgeon Craig, also of the same State, who, from time to time, saw many of the above cases, and who finally (as members of the furlough board) had an opportunity of examining them before leaving the hospital.

ERRATA.—First paragraph, seventh line, for *names*, read *records*.

ARTICLE V.

Facts bearing upon the Nature and Effects of Malaria and Diseases at Fort Gibson, in the Fall and Winter of 1834. By General G. J. RAINS. Read before the Medical Society of Augusta, Ga., August 1, 1866.

In the year 1833, the Arkansas river rose an unprecedented height, overflowed all the bottom lands, and while it benefitted some few places, it piled the sand three feet deep on others, before fruitful, and rendered them barren and desolate.

During the year succeeding this great rise, September, 1834, I joined my company at Fort Gibson, fifty seven miles west of Arkansas. I had been on duty in the Indian department at the Choctaw agency, in about thirteen miles from Fort Smith, and about three from the Arkansas river, a thick growth of timbered land intervening. The malaria had reached the agency before I left, and I had been severely sick with fever, and was convalescing, when I went to Fort Gibson, already noted, from medical statistics, as the most unhealthy post in the United States occupied by troops.

The post of Fort Gibson is situated on the east bank of the Neosho river, about two and a half miles from its confluence with

the Arkansas, having a bottom land south and southeast, in juxtaposition to that post, extending to the river, having stagnant pools, and a pond or lake, of about one half-mile in extent, in a thick canebrake, in about three fourths of a mile distant, south. In an easterly direction were the dragoon barracks, occupied by four or six companies of dragoons, and Fort Gibson, with six companies of infantry, composed of, officers and men, fifty two each in number when full. The garrisons were found sickly and sickness increasing rapidly, mainly congestive fever and dysentery.

We began to bury the dead with martial honors, until the musicians became sick, and notice made that the music and deadmarches were going almost all the time. When that was stopped, our whole business was to dig graves, make coffins, and bury the dead. Out of about thirty officers there were soon but three for duty, viz.: Adjutant Miles, who, I think, had been sick, and was afterward General Miles, killed at Harper's Ferry, fighting against us, Captain Dawson, who, cadaverous looking, was said to take daily a dose of charcoal, and your humble servant, convalescing as said, with diarrhœa, a check to which immediately brought on fever.

A singular case I must here mention. Lieutenant West, of the Seventh infantry, some three or four years before, had taken the venereal disease from an Indian squaw, and had been apparently cured by Surgeon Pitcher, since of the Medical College at Detroit, Michigan; had married, and his wife had one child, diminutive and sickly. He was down with the dysentery, and Dr. Hawkins informed me that his old disease had again broken out with all its violence, and it hastened his death.

Finally, we were burying the men all day, and the grave-yard between the two commands had the prisoners of both dragoons and infantry, with other details, almost continually employed digging graves, and these accused one another of hooking their graves, the term they used, as the first that came with a corpse put it into the prepared pit.

Coffins were soon out of the question, only rough boxes were made, and to supply plank for this purpose, all at the post was used up, and the ceiling taken down from some of the rooms in the barracks, for the boards. The dragoons suffered, if possible, worse

than the infantry, being nearer the swampy land, which was just back of them, and I heard a discussion between Colonel, afterward General Mason, and Captain Johnston, of the Quartermaster's department, concerning a requisition made from the War department for the number of deaths, which was stated, could not be told, as the dragoon officers were all sick, and some men, not known, who had deserted. It often occurred that two bodies were put into the same grave together, the upper not being more than a foot from the surface of the ground, and occasionally these deposits were made after night, by candle or torchlight.

I have seen battle-scenes, but none so horrible as this, where it seemed a man's business was to die. The diseases were of three-fold character, viz.: dysentery, fever congestive, and a nameless disease, which would commence in apparently a healthy subject, as a very small aphthe inside the upper lip, which soon became a sloughing ulcer, of portentous magnitude, before it destroyed the man.

The cause of this singular disease was attributed falsely to Surgeon Finley giving enormous doses of calomel to soldiers a few months previous, when out on the Western prairies, as I had several attacks myself, which I found in my case yielded to application of sulphate of copper, and Cherokee Indians in the vicinity of the fort had it also. An estimate of the number of deaths may be inferred from a remark of Surgeon Bailey to me, that from the building which he afterward had fitted up, and occupied as quarters for himself and family, more dead bodies, of dragoons alone, had been carried out of that house that season than, if brought back again, would chink it to the roof. I examined the locality, the evident source of this malaria, and found numerous ponds of stagnant water left by the river the year before, with much decaying vegetable matter all through the woods—the water, the earth, and the air replete with organic formations in a state of decomposition, and the air visited by perfumes, the most perceptible to the olfactory nerves being something like that of the cucumber. The stagnant air, loaded with millions of dead infusoria, actually conveyed the idea that there was no such thing as malaria proper, but that so called was loaded with death, to come

in contact with the living fibre in the lungs and body of man. To go in bathing, or in any manner to check insensible perspiration for however short a time, was the certain passport to a fever.

If remembered aright, calomel was the sheet-anchor in this storm of death, and Surgeon B. M. Byrne, U. S. army, once told me that he had never lost a patient from dysentery, which he always treated with a dose of calomel, and demulcent food and drinks, and he had probably a thousand cases in his time. He considered the liver the locale of the disease, and a vitiated secretion of bile the cause.

In the winter the diseases most prevalent were severe influenzas and pneumonias—the former epidemic, the latter endemic, if not contagious, as it seemed to pass rapidly from patient to bunkmate, so that but two or three days would elapse before the death of both.

During the prevalence of the severe malarious diseases during the fall and winter of 1834, at Port Gibson, it was observed that the livers of both men and animals presented, after death, a dark, slate color. The livers of all the animals slaughtered were thrown away by the butchers, on account of their dark, unhealthy appearance.

ARTICLE VI.

Is Asiatic Cholera Contagious? Read before the Providence Medical Association by H. W. King, M. D., Surgeon-General of Rhode Island, and communicated for the Boston Medical and Surgical Journal.

This question is now of public interest, in view of the anticipated coming of the disease. Doctors disagree upon it. This is no new phase in the history of medicine. Doctors have disagreed as to the contagiousness of nearly all diseases which are most strongly influenced by epidemic conditions. It is so difficult to determine which is the prime source of disorder, when both contagious and epidemic causes are operating! Hospital gangrene, puerperal fever, yellow fever, scarlet fever, typhus fever, whooping cough, and plague were for a long time held in doubt, and

finally, after hot dispute, quietly found place, one by one, in the list of contagious diseases.

Cholera is most prominent among those of which we are still in doubt, and about which we may dispute. I propose briefly to examine a few of the reasons recently given to the public why some "physicians cannot believe cholera to be contagious," and to extend a few remarks upon the subject of contagion.

First. On board the steamship Atlanta, which brought the disease to New York last November, it was confined to the steerage during the whole passage. The fact that the disease did not spread to other parts of the ship is relied upon as evidence of its non-contagious character. It would seem to me, better evidence of its non-epidemic character. This fact, which is thought too singular for a freak of contagion, has had its parallel many times in the passage of typhus fever to our shores, and no doubts are now entertained as to the contagion of typhus.

Second. The Emperor of the French, holding the destiny of the nation, "was permitted," recently, to visit the cholera hospitals of Paris, and did not take the disease. This act of the emperor is considered proof that both he and his medical advisers believed the disease to be non-contagious; that the possibility of his taking it was not even doubtful. Does it prove so much? The French once had another emperor, who, with responsibilities as great upon him as ever rested upon his nephew, was permitted to cross a bridge at Lodi, swept by thirty Austrian cannon. Does this prove that he and his military advisers were satisfied that there was no danger in the passage? that the possibility of his being hit was not even doubtful?

Third. In India, where the disease has become naturalized, and has prevailed for a long time, the belief is universal that it is not contagious. The same argument would prove the plague to be non-contagious, while we all hold the contrary. That, too, is a habitant of the East, and like views are entertained of it there.

Fourth. Cholera can be arrested in its progress by proper medication, and the question is asked: "Is this true of smallpox, or any other confessedly contagious disease?" It may not be true of smallpox, but it is true of many other confessedly contagious diseases, among them itch, syphilis, and porrigo.

Fifth. In cholera there is no definite period of incubation, nor any regular stages of development in its progress and decline, while it is asserted in all known contagious diseases these stages are generally clearly marked. Is this statement true? Let us examine and compare it with the teachings of one of the best of American authors. Dr. Wood says of pertussis: "The period of incubation is from two to thirty days;" of measles, "from one week or less to three weeks or more;" of scarlet fever, "two or three days to two or three weeks;" and of typhus fever, "from immediately to several months." Each of these, in its progress and decline, is as irregular as in its development, and these are all well-known contagious diseases. The period of incubation of the latter would seem indefinite enough to correspond with cholera, or almost any other disease.

Sixth. "One attack of cholera furnishes no security against a second." Neither does one attack of gonorrhœa, syphilis, porrigo, frambœsia, or itch furnish security against a second attack, and these are all contagious diseases.

Seventh. "Cholera remains quiet for a long series of years, almost constantly existing at the place of its origin, and does not extend beyond that region. Could this be true of any strictly contagious disease?" It is true of the plague, and also true of typhus and yellow fever.

Eighth. It is stated that it is an established law of cholera that the prevalence of the disease is in inverse ratio to the height above the level of the sea, or large rivers, or bodies of water in the vicinity, and the question is asked: "Was it ever known or suspected that any such law of elevation existed in relation to any strictly contagious disease?" I answer, it is known that the same law exists in relation to the prevalence of nearly all disease, both contagious and

non-contagious. The exceptions are those diseases peculiar to mountainous regions. This idea, now advanced by Dr. Snow, was used by Dr. Rush in his argument against the contagiousness of yellow fever. It is answered by stating the fact, that the law of elevation in relation to the prevalence of disease follows the law of settlements. The population of the world is so distributed.

Ninth. "Cholera is uniformly checked in its progress by cold, and prevails most severely in hot weather. Smallpox, on the contrary, and other contagious diseases, which do not depend upon actual contact, prevail most severely in cold weather."

How is it with yellow fever? It is uniformly checked by cold; indeed, it requires a higher temperature for its existence than cholera. The question of the contagion of this disease has been more fully discussed than that of cholera, and the professional mind is generally settled in the belief that it is contagious. This brings me to a point where theory might be introduced into the argument. Do not all contagious diseases dependent upon corpuscular origin prevail most severely in cold weather? And do not all diseases dependent upon cryptogamous agency for their cause prevail most severely in warm weather? The prevalence of cholera in Russia during the winter might tend to prove one part of this hypothesis. The life of the sporule may have been protected in the underground huts, at a temperature where germination could go on, while in the clear, cold air above no epidemic cause may have existed.

The most of the arguments advanced to prove the non-contagion of cholera may be summed up in this simple statement: Cholera is not contagious, because it does not follow the same law that smallpox does; reasoning as though smallpox were the type of contagious disease, and judging all other diseases by it. As well might itch be taken for the type, and other diseases judged by that. From what has been shown, it would appear that cholera is not more anomalous than many other diseases known to be contagious,

yet it is not contended that there is any general law governing contagious disease, for there is none. Each is peculiar to itself. There may be a resemblance in form, or kind of substance producing disease, that may be classified. We have contagious diseases that are known to be of animalcular origin, as scabies, dracunculus, pulex penetrans, etc. We have others that we know to be of fungous origin, as favus, sycosis, porrigo, etc.; and others that we believe to be of corpuscular origin, as syphilis, hospital gangrene, smallpox, etc. In thus classifying, we have a resemblance in the kind of *materies morbi* forming each class, and here the resemblance ends. As the disease produced by the acarus scabiei differs from that produced by the filaria medinensis, and as the disease produced by variolous matter differs from that produced by syphilitic matter, so may we expect cholera to differ from other diseases, though produced by the same class of contagious matter.

In many of the arguments upon this question of contagion there seems to be wanting a clear idea of the definition of the subject. The best definition that I have seen, and the one that seems to me to convey a near idea of what is generally understood by the word contagion, is that given by Dr. Wood, in his Practice of Medicine. In this, contagion is held to be nearly synonymous with infection, but contagion is allowed a broader signification, and to embrace the meaning of both terms, including contactual and remote propagation. An agreement in the understanding of terms, though we still might differ, would save many words in dispute. With the microscope we may hope some day to solve the mystery that now divides us. It seems no deeper hidden than was the poison of malaria before Dr. Salisbury discovered that, instead of its depending upon the decomposition of vegetable matter for its origin, it has its source in cryptogamic life. He or some one else may show that, instead of cholera depending upon the "decomposition of filth," vegetable organism must exist in choleraic air, and that germ and human excrement are necessary for its growth.

The Medical Association of Georgia.

This Association convened in annual session, in the City of Atlanta, on the 21st of June last. The meetings of the Association having been necessarily suspended during the war, it was the first opportunity enjoyed by its members of communing as a body since April, 1861. We were sorry to see so few present, but are willing to attribute it more to the failure of receiving due and timely notice than any want of interest in the Association. The following officers were duly elected and installed: Dr. A. Means, President; Dr. F. O. Dannelly, 1st Vice-President; Dr. L. H. Orme, Recording Secretary; Dr. J. L. Moore, Corresponding Secretary; Dr. H. L. Wilson, Treasurer.

Through Dr. Means, Chairman of the Committee on Prize Essays, an essay was reported on Diphtheria, with the motto, "*Sis sub judice*," for which the prize of fifty dollars was awarded. It was from the pen of Dr. E. L. Gaillard—ordered to be published so soon as funds could be obtained.

Dr. Habersham moved to amend the Constitution by striking out that clause authorizing the admission of State licentiates to membership in the Association. After some discussion, on motion of Dr. Godfrey, the further consideration of the subject was postponed to the next meeting of the Association.

The following resolutions were adopted:

Resolved, That the permanent location of the Association at some suitable place, in the opinion of this meeting, is called for by the highest interests; and that, in view of said interests, we do invite and call upon its members, in every portion of the State, to meet with us at our next annual meeting, and settle definitely this question.

Resolved, That the sum of one hundred dollars be hereby offered by the Association for the best Prize Essays—$50 for the best, $30 for the second, and $20 for the third.

The next annual meeting of the Association will be held in Griffin, on the second Wednesday in April, 1867.—*Signet & Journal.*

BIBLIOGRAPHICAL NOTICES.

[From the large amount of original matter presented in this number of the SOUTHERN MEDICAL AND SURGICAL JOURNAL, we are compelled to defer the more elaborate reviews to another issue.]

ARTICLE I.

A Practical Treatise on the Diseases of the Sexual Organs of Women. By F. W. VON SCANZONI, Professor of Midwifery and Diseases of Females, in the University of Wurzburg; Counsellor to his Majesty, the King of Bavaria; Chevalier of many Orders. Translated from the French of Drs. H. DOR and A. SOCIN, and annoted, with the approval of the author, by AUG. K. GARDNER, A. M., M. D., Professor of Clinical Midwifery and the Diseases of Women, in the New York Medical College; Author of the "Causes and Curative Treatment of Sterility;" Editor of Tyler Smith's "Lectures on Obstetrics," etc., with upward of sixty illustrations. New York: Robert M. DeWitt publisher. 8vo. 670 pp.

It is to the study of specialties in medicine we owe, in a great degree, the decided advances made during the present century in our profession; and the monograph before us abundantly illustrates the advantages of this system. The work is divided into seven parts, devoted to the pathology and therapeutics of the uterus; of the ligaments of the uterus; of the fallopian tubes; of the ovaries; of the vagina; of the external genital organs, and of the breast. Each subject is elaborately treated, and the author has diligently striven to make his work a complete compilation and reflex of the present state of knowledge. We know of none more calculated to be useful to the general practitioner, and regret that we can not give it a more extended notice at present.

ARTICLE II.

Outlines of Surgical Diagnosis. By GEO. H. B. MACLEOD, M. D., F. R. C., S. E., eel. fac. phys. and surg., Glasgow; Lecturer on Surgery, Anderson's University; Surgeon to the Glasgow Royal Infirmary, and the Lock Hospital; late senior Surgeon Civil Hospital, Smyrna, and General Hospital in Camp before Sebastopol, etc., etc. American edition, reprinted from advance sheets. New York: Bailliere Brothers, 1864. 8vo. 505 pp.

As correct diagnosis is indispensable to safe and judicious treatment, any contribution upon the subject should be gratefully

received. While we cheerfully accord to the work before us a high degree of merit, we can not withhold the expression of our conviction that the great desideratum in diagnosis is simplicity as well as unerring accuracy, and that the author would not have sacrificed anything of intrinsic value by leaving out many of the unimportant details, which tend rather to obscure the strong points in each case than to add to their value. But this is the only complete work of the kind in our language, and we cheerfully recommend it.

ARTICLE III.

Clinical Lectures by Prof. A. VON GRAEFE, *on Amblyopia and Amaurosis, and the Extraction of Cataract.* Translated from the German, by HASKET DERBY, M. D., Surgeon to the Massachusetts Charitable Eye and Ear Infirmary, etc. Boston: D. Clapp & Son, printers, 1866. 8vo. 86 pp.

The high authority of Professor Graefe in opthalmology, and the new light thrown upon the important topics of these lectures, must make them peculiarly acceptable to those who devote any attention to diseases of the eye. The Germans have latterly done more than any other people toward the advancement of this branch of medicine, and we therefore naturally look with much interest to their publications on the subject.

ARTICLE IV.

A Comprehensive Medical Dictionary, containing the Pronunciation, Etymology, and Signification of the terms made use of in Medicine and the Kindred Sciences, with an Appendix, comprising a Complete List of all the more important articles of the Materia Medica, arranged according to their Medicinal Properties; also, an Explanation of the Latin Terms and Phrases occurring in Anatomy, Pharmacy, etc.; together with the necessary directions for writing Latin Prescriptions, etc., etc. By J. THOMAS, M. D., Author of the System of Pronouncing in Lippincott's Pronouncing Gazetteer of the World. Philadelphia: J. B. Lippincott & Co., 1864. Pp. 704.

This work supplies a want felt by every one commencing the study of medicine. The student will find in this medium-sized volume concise, clear definitions, and full explanations of the etymology of the various words and terms used in Medicine and the collateral sciences. Another feature of the work, of practical

importance, is the pronunciation of the various terms given in the Dictionary. "What correct spelling is to the writer, correct pronunciation is to the speaker. If either should be wholly neglected, the most perfect language would soon become a babel, and fall into utter corruption." The Appendix contains matter of value to the student, viz: table of Materia Medica, containing the names of all the medicinal articles of any importance, arranged according to their medicinal properties; table of doses; synopsis of respective nosologies of Cullen and Good; method of writing prescriptions, etc. The work is printed in the best style of the art, as is characteristic of all the works issued by the liberal and enterprising publishers, J. B. Lippincott & Co., of Philadelphia.

ARTICLE V.

Catalogue of the University of Virginia, 1865–66 (*with Catalogue of Sessions* 1861–65 *prefixed*).

Just before the close of the war, it was reported in this part of the South that the University of Virginia had been sacked and burned by the United States forces. The friends of this noble institution will be gratified to know that it passed through the recent civil war *intact*, without the loss of a Professor, or of a book. The catalogue before us gives proof of the undiminished confidence and interest of the public in this institution, which might well serve as a model for every college in the Southern country. A large number of the educational institutions of the South were burned during the *sectional war;* and all of them have been, more or less, prostrated and crippled by the subversion of the agricultural system of the South, and the wide spread financial ruin following the triumph of the destructive measures of the Black Republican faction. In the face of all these difficulties, and at the close of a bloody and desolating war, which expended its fury chiefly upon Virginia, the class of the University numbered two hundred and fifty-eight. Notwithstanding all their losses and deep distress, the Southern people have still left for them the development of perfection of their educational institutes. It has been said with truth that "man can not propose a higher or holier object for his study than education, all that pertains to education."

During the recent war, the dormatories of the University furnished comfortable hospital accommodations to hundreds, and we might say thousands, of the wounded of General T. J. (Stonewall) Jackson's army, during his celebrated campaign in the Valley of Virginia; and two of the Professors of the Medical School, J. L. Cabell, M. D, Professor of Comparative Anatomy, and Physiology, and Surgery, and J. S. Davis, M. D., Professor of Anatomy and Materia Medica, conducted one of the largest and best-ordered hospitals in the Southern Confederacy.

The amount of valuable material for clinical instruction, gathered by these learned and accomplished physicians, during their most efficient and untiring ministrations to the Confederate sick and wounded, must have been immense, and of incalculable value to the University.

At the present time, when we are reviving our institutions, the peculiar features of the Medical department of the University of Virginia are well worthy of the attention of the physicians of the Southern States.

"In nearly all the medical schools of this country, the usual length of the session is *from four to five months.* In order to embrace all the important branches of Medical science in a course of instruction compressed in so short a time, it is found necessary to employ the services of six or seven Professors, who deliver six lectures a day. Under this arrangement the student, if they take all the tickets, are required to spend nearly the whole day in listening to lectures, delivered in rapid succession, and treating of diverse topics. None but those who have had personal experience in this matter can fully appreciate the troubles and difficulties which beset a student when he first enters the school; the fatigue of body and perplexity of mind which he inevitably experiences in his painful efforts to hear every lecture and master every subject. In attempting, after the close of the lectures for the day, to bring in review the topics discussed by his teachers, he finds links in the chain, here and there, broken; he flies from one subject of thought to another without adequately mastering any, and confounded by their number, and the utter impossibility of keeping pace in his private reading at night with the lectures of six Professors, he

despairs of doing more than retaining such portion of the facts stated in the lectures as may happen to make the strongest impression on the mind.

In the Medical department of this Institution, the length of the session, which is *nine months*, enables four Professors to perform all the duties which are elsewhere assigned to six. The students attend but *two lectures* a day, and thus have ample time for private reading, and for pursuing their anatomical dissections. The supply of *subjects* is ample, and the Demonstrator devotes the whole of every afternoon to his duties. He guides the labors of those who are at work, and explains to them the structures which are successively exposed."

It is one of the peculiar advantages of the University Medical School, that it unites the plan of private instruction by private pupilage with that of public lectures; while the length of the session enables the Professors to pursue a philosophical order of studies, and thus to afford the students an opportunity of mastering the elementary branches before attention is directed to their practical application.

ARTICLE VI.

History of Florida. By L. D. STRICKNEY, Florida *Union*, edited by J. K. STRICKNEY, Jacksonville, Florida.

We have derived profit as well as pleasure from the perusal of the chapters of this valuable History of Florida, which are published weekly in the Florida *Union*, and we hope that the author will, at an early day, issue his labors in book form, and thus secure them from the accidents of time. A most interesting feature of this work is, that it embraces a wide field of study, and includes extended and careful descriptions of the climate, soil, and natural productions of Florida. We have always regarded such efforts at the South with great interest; and they are especially valuable at the close of a desolating war, in which some of the most valuable libraries of the South were either burned, destroyed, or "captured," and shipped out of the country.

Pathological Anatomy of Cholera. Communicated for the Boston Medical and Surgical Journal. By W. F. MUNROE, M. D., Boston.

In order to understand the theory of treatment of any disease, a knowledge of its pathological anatomy is absolutely essential. This fact is more often overlooked with regard to cholera, perhaps, than to any other disease, and for the very natural reason that no investigations in this direction have as yet thrown much light upon the subject. Still, to properly appreciate the numerous theories constantly brought forward, the results, both positive and negative, of the *post mortem* examinations should be present to the mind. To bring together facts scattered through many different treatises, has been the object of the present *resume.*

There are some few cases on record where patients have succumbed to the prodromic symptoms before the cholera proper had declared itself; but as there have been preserved none of the pathological changes, I shall pass at once to those recorded after death during the second period, or that of collapse.

In these cases, there is frequently a sudden elevation of temperature; invariably the body loses its heat, but slowly. The muscular spasms often continue to a more or less extent, and, in India, cases are reported in which the attendants have been forced to secure the limbs of the dead, so great was the moral effect upon the neighboring patients. The blueness of the face and members remains; the subcutaneous cellular tissue is dry; the muscles are dark colored and but slightly consistent (exceptional, Valleix). This bluish appearance is also noticed in the greater part of the spongy bones, and even to the roots and crowns of the teeth. The digestive canal is pale and discolored in places, but in general offers a dark color, due to the arrest of the blood. From the œsophagus to the rectum, but particularly at the end of the ileum and in the cœcum and colon, is often found an eruption of hard, opaque

bodies, about the size of the head of a pin, which are nothing more than the swollen follicles, such as are often found in other diseases where the serous exhalation is increased. The stomach and intestines contain a variable quantity of a flocculent liquid, sometimes acid, sometimes alkaline in reaction, and of an insipid odor. Most authors deny the presence of any bile, but Dr. J. C. Dalton and Niemeyer say that the bile is present, but recognized with difficulty, from its extreme dilution. In color this liquid varies from a greyish white to a chocolate, the darker being more common in the lower parts. Its nature is generally considered to be that of the serum of the blood, although Andral and Bouillaud consider it mucous, and Bouillaud attributes to it some specific qualities. The flocculi floating in it, as well as the creamy, greyish-white membranes with which parts of the entire digestive canal are covered, consist of epithetical scales in different stages of perfection. Valleix, Bouillaud, and several others have occasionally noticed in the gall-bladder the presence of a liquid resembling that found in the intestines, while J. Brown has usually found it turgid with black blood. Virchow has signalized an enormous accumulation of fat in the villi of the intestines, a fact attributed to the ordinary occurrence of the attacks during the process of digestion, when the vessels are loaded with chyle. In other respects the biliary and lymphatic vessels are unaltered. The kidneys, particularly in their cortical substance, are engorged with black, diffluent blood, and a certain flaccidity of their tissue is noticed by Dr. Dalton, as well as a peculiar smell, resembling that of molasses, which is exhaled from their cut surface and replaces the ordinary renal odor. The liver is congested with black blood; the spleen is generally small and hard, while the other parenchymatous tissues are conoested and of a peculiar bluish color; the bladder, ordinarily empty and retracted, but occasionally containing a certain amount of altered mucus, exhibits on its internal surface membranous patches similar to those found in the digestive canal; the lungs are usually

collapsed, flabby, and hardly obstructed—rarely, however, there is extensive congestion, and apoplectic centres even have been found in them. Small patches of the whitish membrane spoken of in connection with the digestive canal are sometimes found in the bronchial tubes. The heart is small, flabby, and easily torn; the right ventricle filled with black, sticky blood, the left usually empty. Ecchymoses are sometimes found on the pericardium and on the endocardium of the left ventricle. The whole venous system is engorged with the same black, sticky blood, which coagulates very slowly and parts with but little if any of its serum. Upon exposure to the air, according to Rayer's investigations, it oxidizes more slowly than in its normal condition, owing to the absence of the saline substances which favor oxygenation. Schmidt found the oxygen diminished more than one half. The fibrin, albumen, and salts have been found deficient by most chemists, although Robertson, of Edinburgh, states that the fibrin is usually in large amount, and Andral that albumen is present in normal quantity. Becquerel concludes that the proportion of the globules is increased; the serum, less abundant and denser, contains an abnormally large proportion of extractive matters, salts, and particularly fatty matters. Microscopic examination has shown the globules normal in appearance, but Donné has remarked a certain viscosity, which prevents them from slipping easily in the liquid in which they swim. Dr. Parkes has observed that, in some cases, the addition of a few drops of the liquid taken from the intestine would restore the arterial color of the blood. The serous membranes are all more or less dry and sticky, the peritoneum particularly so; the cerebral and cerebrospinal vessels are more or less engorged; the cerebral substance is likely to be congested, and even the nerves and their ganglions may be in the same condition, although the nerve-tissue is never altered. The semilunar ganglion, thought by some authors to be the original seat of the disease, has been found normal by the majority of pathologists.

In subjects who have died in the period of reaction, there is less venous but more active and inflammatory congestion; the brain is dotted with puncta cruenta; the lungs are sometimes inflamed or hepatized; the blood is redder and contains more serum; the peculiar liquid has disappeared from the digestive canal; the serous membranes are moist; the agminated follicles are occasionally a little swollen, but without showing any of the characteristic appearances of typhoid fever; the bladder contains a variable quantity of urine.

Thus far the alterations given us by pathologists are: 1st, the general injection of the venous system, giving the peculiar color to nearly all the organs; 2d, the characteristic liquid found in the digestive canal; 3d, the absence or altered condition of the mucus in the different cavities which are lined by a mucous membrane; 4th, the development of the glands of the intestine—evidently most insufficient grounds for the basis of anything more than a purely speculative hypothesis.

NECROLOGICAL NOTICES.

James Hamilton Couper, of Glynn County, Georgia.

It was with feelings of deep sorrow, that we noticed in the secular papers the announcement of the death of the distinguished Naturalist, at his residence on St. Simon's island.

Mr. Couper occupied a distinguished position in science, and was, perhaps, more widely known in Europe than in Georgia, his native State. Many valuable contributions upon the Geology and Natural History of the Southern States, from his pen, have been published in the scientific journals; and he has been the generous donor of several splendid collections of fossil remains to the museums of Washington, Philadelphia, Charleston, and London.

In 1861, Mr. Couper presented his entire cabinet of Conchology and Palaeontology to the Museum of the Charleston College. This magnificent contribution added greatly to the interest of these

special departments, and stimulated many citizens to contribute rare specimens from their private cabinets.

Possessed of a large fortune, and endowed by nature with the highest social and intellectual qualities, Mr. Couper exerted a most extended and useful influence in the world of science, and attracted to himself the esteem and friendship of many of the most distinguished savans in America and Europe. The estimation in which he was held abroad, will be shown by the following extract from the travels in America of the distinguished English Geologist, Sir Charles Lyell.

"December 31st, 1845. At the end of a long day's sail, our steamer landed us safely at the village of Darien, on the sandy banks of the river Altamaha. * * The next morning, while we were standing on the river's bank, we were joined by Mr. Hamilton Couper, with whom I had corresponded on geological matters, and whom I have already mentioned as the donor of a splendid collection of fossil remains to the Museum at Washington, and, I may add, of other like treasures to that of Philadelphia. He came down the river to meet us in a long canoe, hollowed out of the trunk of a single cypress, and rowed by six negroes, who were singing loudly and keeping time to the stroke of their oars. He brought us a packet of letters from England, which had been sent to his house, a welcome new year's gift, and when we had glanced over their contents we entered the boat to ascend the Altamaha. * * About fifteen miles above Darien, on the opposite bank, we came to Hopeton, the residence of Mr. H. Couper, where we spent our time very agreeably for a fortnight. Much has been said in praise of the hospitality of the Southern planter, but they alone who have travelled in the Southern States can appreciate the perfect ease and politeness with which a stranger is made to feel himself at home—horses, carriages, boats, servants, are all at his disposal; even his little comforts thought of, and everything is done as heartily and naturally as if no obligation were conferred. When Northerners who are not very rich receive guests in the country, where domestic servants are few and expensive, they are often compelled, if they would ensure the comfort of their visitors, to perform menial offices themselves. * *

There is a warm and generous openness of character in the Southerners which mere wealth and a retinue of servants can not give; and they have often a dignity of manner, without stiffness, which is most agreeable. The landed proprietors here visit each other in the style of English country gentlemen, sometimes dining out with their families and returning at night, or, if the distance be great, remaining to sleep, and coming home the next morning. * * * * * *

"I found, in the well-stocked library of Mr. Couper, Audubon's Birds, Milhaud's Forest Trees, and other costly works on natural history; also, Catherwood's Antiquities of Central America, folio edition, in which the superior effect of the larger drawings of the monuments of Indian architecture struck me much, as compared to the reduced ones given in Stephens' Central America, by the same artist, although they are also very descriptive."

Dr. William Rushton, M. D.,

Died in New Orleans, after a brief illness, on the 21st day of November, 1862, at the age of fifty-four years.

He was born near Bolton, Lancashire, England, in 1808. He studied the profession of medicine in Edinburg, Scotland, and graduated at the famous school of that city in August, 1827. In order, however, to observe disease under the treatment of other leading lights of medical science, he repaired to London, and continued two years longer in the prosecution of his studies.

The first professional duties to which Dr. Rushton devoted his services was the position as surgeon to one of the East India Company's ships to Calcutta. At the conclusion of this voyage, which occupied his attention for one year, he returned to England, and immediately sailed for New Orleans, and arriving in this city in 1832, he determined to make his home in the great emporium of the Southwest. After a residence of two years, he married Miss Elizabeth West, a daughter of an estimable family, and connected with many of the most highly refined and influential of our Creole population.

From the moment of the arrival of this young and enterprising stranger in this city he began a career of usefulness, and attained a degree of eminence as a practitioner rarely enjoyed by medical men: for he was affable in manner, intelligent in conversation, well versed in the practical details of a learned profession, possessed of energy and decision of character, and armed with these elements of success, he so speedily entwined himself around the hearts of our people, as to render his untimely loss a serious public calamity. Generous and warm-hearted, he assisted the needy with his bounty, entirely free from pride or ostentation. Taught by the pure waves and free winds that bore him to these shores to love freedom of speech and action, he became intimately identified with the manners, customs, and institutions of our people; and when political strife arose, he mingled his sorrows with his friends, and grieved with profound sympathy for the cause of those with whom he had passed a well-spent life, and who had saluted him, a stranger in a strange land, with kindness. His heart was a fountain of goodness and benevolence, and, going to his grave without an enemy, he "rests from his labors, and his works follow him."

Though buried far away from the graves of his fathers, his bier was moistened by the tears of affection, and his memory will be long held dear by friends who saw within him the soul of honor and generosity. May God comfort the bereaved hearts of those within that home which knows him no more!—*N. O. Medical and Surgical Journal.*

Dr. Erasmus Darwin Fenner, M. D.,

Died in New Orleans on the 4th day of May, 1866. He did not long suffer the pangs of disease, for a short illness quickly severed the slender cords of life. Indeed, but few of our citizens were aware that this man of energy was feeble in strength, and that an abrupt period was about to terminate his career of public service.

Dr. Fenner was a native of Franklin, North Carolina. His father, who was a physician, educated him to the practice of the medical profession, and he first entered upon the arduous duties of his calling at Clinton, Mississippi. Seeking a wider field for

the exercise of his talents, he made his residence in this city in 1840. His first undertaking that directed public attention to his labors was the organization, in conjunction with Dr. A. Hester, of the *New Orleans Medical Journal*, which was begun in 1844, and from this effort originated the present *New Orleans Medical and Surgical Journal*. His next effort for good was the establishment of the "New Orleans School of Medicine," and since the termination of our disastrous political strife, he interested himself in establishing the *Southern Journal of Medical Sciences*.

At all times ambitious of success, Dr. Fenner struggled to attain an enviable distinction among his fellows. In order to confer benefit upon his beloved section, he often attempted to penetrate the mysteries surrounding the origin and cause of the malignant febrile diseases of the Southwest. His efforts were constantly directed to the improvement of the sanitary condition of our city, and in the last paper given by him to the medical profession, the lamented author sums up his observations in regard to a question which is of present and paramount interest to the people of New Orleans. He is discussing epidemic diseases and quarantine, and says:

"All efforts hitherto made to prevent their extension by means of quarantine and sanitary cordons have failed, and we have but little reason to hope they will ever succeed. For twenty years we and some others have labored to convince the people of New Orleans that the only way to make the city healthy is *to make and keep it clean*. But we have labored in vain. In the mysterious course of events, the hand of the tyrant has been brought to our aid, and the results are marvelous. Will our citizens profit by this experience, and continue to enforce their health ordinances, as the Federal authorities enforced them? If they do not, the consequences will surely be deplorable."

This is our lamented friend's last professional will and testament to the people whom he loved so well, and of which, when reading them over on his bed of sickness, he said to his associate: "The future will prove these words to be true."—*New Orleans Medical and Surgical Journal.*

DISINFECTANTS AND HOW TO USE THEM.

[Advised by the Metropolitan Board of Health.]

(1.) *Quicklime*—to absorb moisture and putrid fluids—use fresh stone lime finely broken; sprinkle it on the place to be dried, and in damp rooms place a large number of plates filled with the lime powder. Whitewash with pure lime, and not with kalsomine.

(2.) *Charcoal powder*—to absorb putrid gases—the coal must be dry and fresh, and should be combined with *lime:* This compound is the "*calx powder.*"

(3.) *Chloride of Lime*—to give off *chlorine*, to absorb putrid effluvia and to stop putrefaction: Use it as lime is used, and if in cellars or close rooms the *chlorine gas* is wanted, pour strong *vinegar* or diluted *sulphuric acid* upon your plates of chloride of lime occasionally, and add more of the chloride.

(4.) *Sulphate of Iron* (*Copperas*)—to disinfect the discharges from cholera patients and to purify privies and drains: Dissolve ten pounds of the copperas in a common pailful of water, and pour a quart or two of this strong solution into the privy, water-closet, or drain every hour, if cholera discharges have been thrown in those places; but for ordinary use, to keep privies and water-closets from becoming offensive, pour a pint of this solution into every water-closet, pan, or privy-seat every night and morning. Always sprinkle a cupful of chloride of lime or lime powder in the same place and at the same time. Bed-pans and chamber vessels are best disinfected in this way, by a spoonful of chloride of lime and a spoonful of the copperas solution.

(5.) *Permanganate of Potassa*—to be used in disinfecting clothing and towels from cholera and fever patients, during the night, or when such articles can not be instantly boiled. Throw the soiled articles immediately into a small tub of water in which there has been dissolved *an ounce* of the permanganate salt to every three or four gallons of water. A pint of "Labarraque's Solution of Chlorinated Soda" may be used for the same purpose in the tub of water. Either of these solutions may be used in

cleansing the soiled parts of the body of sick or dead persons. May also be used in bed-pans, etc.

PLACES THAT MUST BE DISINFECTED.

(*a.*) For water-closets, use 4 and 3; for privies, use 4, 3 and 2; for bed-pans and close stools, use 3 and 4 or 5; for cellars, use 1, 2 and 3; for vaults and stables, use 1 and 2, or 3 and 4, or any of coal-tar powders.

(*b.*) For soiled clothing, bedding, and carpets—boil whatever can be boiled, if the articles have been soiled by cholera discharges. Use solution of chloride of lime or chlorinated soda, a quart of either solution to ten gallons of water, if the articles are coarse and their colors of no consequence; but on fine clothing, that has been soiled in cholera or fevers, use the disinfectants described under No. 5, in the list above.

(*c.*) For sick-rooms, use 1, 2, or 3; for bed-rooms, ventilate; for closets, cleanse and keep dry; for beds and bedding, ventilate frequently in the sun.

(*d.*) Finally: *Let fresh air and sunlight purify every place and thing they can reach;* open and dry your cellars and vaults; flush the water-closets and drains *daily* before throwing in the disinfectants as directed; let there be no neglect of domestic and personal cleanliness.

CHOLERA.

The Metropolitan Board of Health publish this simple statement, and beg the public to give to it their earnest attention:

Cholera is generally a *preventable* disease, and in its early stages can be arrested, if the habits be good. Study, therefore, *temperance in eating and drinking: do not believe that alcoholic stimulants are useful* in guarding you against an attack. Let the food be nutritious, and keep the digestive organs in a healthful condition. Use no stale or uncooked vegetables. Let your meet be fresh, and your vegetables be well cooked, and all fruits be fresh and ripe.

Cleanliness of the body is of the first consideration. Keep the skin in a healthy state by bathing the whole body, with a free use

of soap. Cold bathing is best used in the morning—never just before going to bed. Dry frictions or the warm bath may be more safely used just before going to bed.

Cleanness in your homes is of equal importance. Let your apartments be dry; never damp. Suffer no decayed vegetables or stagnant water to remain in your cellars or yards. Any disagreeable smell from privies, cess-pools, or sinks is a proof of their unhealthfulness. Remove them by necessary repairs, lime, chloride of lime, or whitewashing. Ventilate well your houses and apartments. Expose your bedding to the air and sun. Avoid excessive fatigue. Keep regular hours in eating and sleeping. Wear flannel next to the skin. A good plan is, if the bowels are at all disordered, to wear a broad band of flannel (a belly-band) around the body, reaching from the hips to the ribs. Maintain the natural temperature of the body by sufficient clothing; especially keep the feet warm. Never, when heated, sit on the grass or stone seats, or sleep under an open window. If exposed to wet, change your boots and clothes as soon as possible. Take no purgative medicines, except by direction of a physician.

By order of the Metropolitan Board of Health.

TREATMENT OF CHOLERA.

Cholera is almost invariably preceded by a painless diarrhœa, and in all cases to be promptly treated.

When diarrhœa is present, go to bed and maintain a position on the back; use abundance of blankets, and send for a physician.

A physician can always be obtained by applying to the nearest police-station.

Stay in bed until you are well; do not consider yourself well until you have had a natural movement from the bowels. Abstain from all drinks. Apply mustard plasters to the bowels.

In the absence of a physician, an adult can take ten drops of laudanum and ten drops of spirits of camphor. A child of ten years may take five drops of laudanum and five of camphor. A child of five years may take three drops of laudanum and three of spirits of camphor; and these doses

may be repeated every twenty minutes, so long as diarrhœa, or pain, or vomiting continues.

This will save time, but in all cases send for a physician.

Do not get up to pass the evacuations, but use the bed-pan or other conveniences. Never chill the surface of the body by getting out of bed.

Remove immediately all the evacuations from your rooms. Scald all the utensils used, or disinfect them with chloride of lime; scald also your soiled clothing.

By order of the Metropolitan Board of Health.

Medical Diagnosis with special reference to Practical Medicine. A guide to the knowledge and discrimination of diseases. By I. M. DaCosta, M. D., Lecturer on Clinical Medicine, and Physician to the Pennsylvania Hospital, etc., etc. Illustrated with engravings on wood. Second edition. Philadelphia: J. B. Lippincott & Co. 1866. 8vo. pp. 784.

The author tells that his chief aim in writing this work has been to furnish advanced students and young graduates of medicine with a guide that might be of service to them in their endeavors to discriminate disease. He has accomplished his task with decided ability, and his book can not fail to be eminently useful, especially in this country, where so little attention is usually given to the study of diagnosis. A clear perception of the real condition of the system and of each organ is an essential pre-requisite to correct prescription, and too much attention can not be bestowed upon the study of the means by which this knowledge may be attained. We, therefore, commend Dr. DaCosta's treatise especially to the junior members of the profession.

BOOKS AND JOURNALS RECEIVED.

Braithwait's Retrospect of Practical Medicine and Surgery. New York, W. A. Townsend, 434 Broome street; Part LIII: July, 1866.

The American Journal of the Medical Sciences. Edited by Isaac Hays, M. D., Philadelphia; Henry C. Lea: July, 1866.

The Medical Reporter, a Semi-Monthly Record of Medicine and Surgery. Edited by J. S. B. Alleyne, M. D., and O. F. Potter, M. D., St. Louis; March to July, 1866.

The New Orleans Medical and Surgical Journal. Edited by Warren Stone, M. D., James Jones, M. D., S. E. Chaille, M. D., and W. C. Nichols, M. D.: July, 1866.

Southern Journal of the Medical Sciences. Edited by Warren Brickwell, M. D., and C. Beard, M. D.: May, 1866.

Illustration of Diseases with the Microscope. Prize Essay. By Francis Peyre Porcher, M. D. Published by the South Carolina Medical Association; Evans & Cogswell, Printers: 1861. Pp. 133, plates 107.

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ORIGINAL AND ECLECTIC.

The Physical Geography of the North Pacific Ocean, the Peculiarities of its Circulation, and their Relations to the Climate of the Pacific Coast of the United States. By WM. HENRY DOUGHTY, M. D., Augusta, Ga.

The relations of medicine to the natural sciences are so apparent that no apology is necessary for the appearance of the present essay in a periodical devoted to this science. Some knowledge of physics and meteorology is indispensable to a proper medical education: the study of optics, acoustics, dynamics, of atmospheric pressure, of the laws governing the pressure of fluids and the expansion of gases, of electricity, of the distribution of heat and moisture, and of allied subjects, suggests their importance and uses to the intelligent physician. An important subdivision of climatology is topography, the study of which, in its relation to climate, should embrace the peculiar features of contiguous portions of the ocean, as well as those pertaining to the land and soil. In considering the climatic characters of any continental section, it is not sufficient merely to recognize its general con-

tiguity to the ocean; the general effects of such relation between land and water are often modified by existing local peculiarities in the circulation of the latter. Uniformity of effects can only result where the general causes are the same, and similar relations maintained; their absence produces climatic diversities. Hence, the difference between the climate of our eastern and western coasts; the adjoining water-surfaces, although equally extensive, yet differ in their topographical features, which, with the incidental assistance of prevailing winds and the continental configuration, cause the difference of climate.

This circumstance brings medicine into profitable connection with the new and beautiful science, the Physical Geography of the Sea. The rivers of the ocean, and its other geographical characters, must appear for study with those of the continents, as well in the benignity of their functions as in their commercial importance.

To the general reader, the sea is at present one of the most interesting subjects. It is not a great while ago since the philosopher and the herdsman alike viewed its waters in the light of a great waste, void of aught but dangerous breakers and striving elements, and destitute of any feature, except its immensity, calculated to exact admiration. For centuries its navigation has been successfully followed by maratime countries, some of which exist only in history, and yet, beyond its use as a medium for commercial intercourse; as a theatre for warlike operations, upon which to assert a fickle supremacy; and as a commodious fishery for our support and comfort, very little is known of it. Its harmonies with the balance of creation were unrevealed. A great mass of saline water, without order and treacherous in all of its attributes, was the substance of the rude idea entertained of it. The faithful mariner committed himself to its faithless waters, feeling no security, except in the computed strength of

his vessel to withstand the furious assaults of the winds and waves, and although often possessed of strength sufficient for this defensive purpose, yet was as often drifted and borne hundreds of miles from his course for the want of that tact and knowledge which the light of recent science furnishes. Even of those portions of the sea which are the constant thoroughfares of international trade, until recently, little was known of their precise circulation, and the developments now made, in their fullest extent, are declared by him,* whose labors have done more to harmonize its workings with the other departments of nature than all others, and to offer, perhaps, the only satisfactory explanation of certain of its recognized actions, to be "only a table or two of contents from the interesting volume which the Physical Geography of the Sea is destined, some day, to open up to us." By the light of his labors, which have secured for him the deserved title of the "Philosopher of the Sea," science has unfolded to our view some of its mysteries, and held up to our admiring gaze its settled harmonies with the rest of creation.

The saltness of the sea does not appear a simple chemico-physical property, designed to make it a fit medium for the countless multitudes that dwell in it, but as intimately concerned in the production and preservation of that system of currents and counter-currents which is so beautifully displayed. The little animals (corals, etc.) which cluster so abundantly upon its sides and in its bed are no longer regarded as supernumeraries in creation, but, in the excretory office that they perform in the economy of the ocean, we observe a necessary, healthful function; they, too, it is supposed, may contribute to its motive power. The various currents—surface and deep-sea currents—of differing temperatures in different parts

* Lieut. M. F. Maury, formerly of the U. S. N.: Physical Geography of the Sea, page 271.

of the ocean-bed, are not now considered as the results of accidental agencies, or of geographical or latitudinal acquirements, but as the grand efforts of old ocean to equilibrate its temperature and saltness, and thereby extending its munificence to the land-climates. The Gulf-stream—that "river in the ocean," as it has been called—is no longer regarded as an accidental emergence of heated and saline water from the tropical sea and gulf, its parent, but its original purposes are discovered as a boon, although at times a terror also, to navigation, a moulder of land-climates, a restorer of lost heat and salinity to the arctic waters, as well as affording an escape for corresponding surplus states from the tropics. Looking at it in its entirety, in the infinity of its operations, we recognize it as the great necessary correlative of the air and the land, without which neither could perform its destined purposes.

There is a strict conformity in all its workings to the known principles of physical and chemical science. We find there life, energy, and ceaseless activity, and above all, in its contemplation, we realize the wisdom and goodness of that Being "who weigheth the waters in the hollow of His hand and fixeth bounds for the sea that it can not pass." In its simple product of hydrogen and oxygen—water—aside from the substances held in solution, its sublime motions, its harmonizing efforts, and their benificent results, we discover an element almost unlimited in its adaptation to the wants of nature. Without it, the world would be converted into a vast charnel-house; the air we breathe would dry up the very fountain of life; the fatness of the earth would be destroyed; and, in the language of another, "the fair face of nature, still as fresh and blooming as in her infant days, would contract in ghastly wrinkles, and the comeliest landscapes grow cadaverous with premature age."

We do not propose, however, to treat of the ocean at large, in any of its interesting characters, nor, indeed, to consider even its general meteorological influences, but simply wish to offer some considerations touching the more prominent peculiarities of one of its subdivisions, viz: the North Pacific ocean. These will relate to the peculiarities of its circulation; the reasons for and the causes of those peculiarities, as we apprehend them; and, finally, their effects upon the climate of the countries to which they are contiguous.

Variations of the form and modes of circulation of the various divisions of the ocean necessarily result from the interposition of continents and parts of continents. The configuration of these masses determines, to a greater or less extent, individual peculiarities of circulation in each of the divisions created, when sufficiently large to vary it at all. Thus, the North Atlantic ocean has the course of its currents determined and preserved, to a great extent, by the relations of the two continents to it; the course and direction of the currents of the Indian ocean result from the intrusion of the neighboring land areas; and the North Pacific ocean has similar characteristics. It follows, therefore, that the circulation of each corresponds with, or differs from, that of the others only as they acknowledge a similarity, or difference, of land relationships, and that their peculiarities are to be brought to light by comparison. Those of the North Pacific must be studied comparatively—with what division shall we compare it? Its natural ally of the northern hemisphere —the North Atlantic—is that most eligible and best calculated, by our more thorough knowledge of it, to guide us in our reasonings. And, first, let us inquire, in what respects do they differ?

The Atlantic ocean is longer and narrower than the Pacific, and in its northward extension gradually merges

itself into the Arctic sea and Polar basin. Its waters coursing northward are almost unimpeded, except by the diurnal rotation of the earth; its principal northern outlet is found between Greenland and the continent of Europe, and is large enough, and wide enough, and deep enough, to allow an easy progress of surface and deep-sea currents. Between Greenland and the American continent there is another great channel, represented by Davis' strait and Baffin's bay, which, although inferior to the other, affords a free communication and interchange of its waters with those of the Polar basin proper. Looking at it in its main body, the relations of the adjoining continents are such as to give it the appearance of a long narrow body of water occupying a valley-depression between them, and having at either end sufficient capacity to permit the free ingress and egress of other currents of water. The continuity of the mass upon its left is comparatively unbroken from the point of Florida to the Island of Newfoundland, near the fiftieth parallel of latitude, at which point the southern extremity of the Arctic waters enters the Atlantic almost at right angles to the advancing shore-line. This being crossed and the point of Greenland reached, the direction and continuity of the shore-line are maintained to the easternmost part of Greenland, whence it turns almost due north, thus increasing the width of the ocean-surface in this latitude. On the right, however, near the thirty-fifth parallel, the continuity of the coast-line is seriously interrupted by the Mediterranean sea, which both receives from and discharges into the Atlantic ocean large bodies of water. From the Straits of Gibraltar northward, the coast-line presents a succession of indentations, and, in some cases, large parts of the continent are entirely separate, standing out in the ocean-bed. In the intervening water-area, the North sea, with its extension inwardly to the Baltic sea

and Gulf of Bothnia, we have "the attempted reproduction" of the Mediterranean sea.

The Pacific ocean (N), on the other hand, appears to be a vast encroachment of water-area upon the eastward and westward extension of the continents forming its boundaries, possessing much greater width than length, and having twice the breadth of the Atlantic. Its northern limit is entirely within the embrace of the two continents, except at the single point, Behring's straits, which, in comparison with even the lesser outlet of the other ocean, is narrow and shallow. The continental arrangement is such that the two coast-lines, running respectively a northwest and northeast direction, very nearly approach each other; and throughout their whole extent do not present a single interruption that allows the descent of northern waters or the escape of southern. The Asiatic boundary, from its commencement to its end, is irregular, and numerous islands stand off from it, thereby multiplying small seas, as the China, Eastern, Japan, Okhotsk, and Kamschatka. On the American coast, no encroachment occurs worthy of mention. Its southwestern part is studded with thick clusters of islands, which, in a general view of it, materially encroach upon its superficies and depth. Moreover, across the point of escape for its waters are the Aleutian islands, extending from the Peninsula of Alaska, on the American side, in a regular continuous series, nearly to the Asiatic continent.

We perceive, then, that while the Atlantic ocean is so related to its contiguous shores as to secure freedom of ingress and egress for its waters at both ends, and has frequent inlettings of its arms into them, the Pacific has only a single outlet for the northern escape of its waters, and through which to interchange with the polar waters. This, moreover, is narrow and shallow, and we find placed immediately in front of it a semi-

circle of islands, as if to submit the waters entering and escaping to a sort of percolation. Freedom of entrance to extraneous bodies of waters is only granted at its southern part (the northern being closed, except at Behring's straits), and even here other waters are brought in chiefly as under-currents.

Bearing in mind these important differences, and recalling the mode of circulation of the Atlantic ocean, ought we not to expect such alterations in the circulation of the Pacific as may be termed *its peculiarities?* We think so, and now invite attention to their discussion.

Along the western borders of these two oceans, the analogies of their circulation are preserved, a signal correspondence in topographical features existing; the important differences—the *distinctive peculiarities*—are thrown along their eastern borders in consequence of the closing up of the outlets for the escape northward of the Pacific waters. The waters of the Atlantic under the guidance of the Gulf-stream, coming full upon the western shore of Europe, escape partly above and partly below it, and, in some measure, course along its border, whilst those of the Pacific, in their great bulk, are turned down along the northwestern coast of America. At the place of distribution of the latter, or near the points where this doubling of the waters upon themselves occurs, those peculiarities are observed, and so far as our information extends, they have never been clearly elucidated.

In the origination of distinct currents, the Indian ocean sustains to the Pacific a relation precisely similar to that which the Caribbean sea and Gulf of Mexico bears to the Atlantic. It is the great central focus to which, we are taught, the moving masses of the entire Pacific ocean ultimately tend, in obedience to that demand of nature which requires the counterbalance and removal of those concentrated saline and heated waters; and from

which are dispatched those benign currents whose special object is the mitigation of the severities of climate in far-off latitudes and countries, both northward and southward. The Indian ocean differs, however, from the Caribbean sea and Gulf of Mexico, in having a higher temperature for its waters, and the force of evaporation there is much greater. Thus it is said that the "temperature of its waters is frequently as high as 90° Fahr.," and that "fifteen or twenty feet of water" are "yearly carried off from this ocean by evaporation;" and, again, that "the evaporation in certain parts of the Indian ocean is from three fourths of an inch to an inch daily."

The current* of most interest to us, issuing from this tropical sea, "makes its escape through the Straits of Malacca, and, being joined by other warm streams from the Java and China seas, flows out into the Pacific, like another gulf-stream, between the Phillipines and the shores of Asia." The general character and course of this stream are closely analogous to and, in some respects, identical with the Gulf-stream; the causes which determine them; their indisposition to mix with the general sea-water, produced by their peculiar chemico-physical properties; their objects and their results are doubtless the same. This current is designed to effect in the Pacific ocean what the Gulf-stream accomplishes in the Atlantic.

From the Phillippine islands, its precise direction has been more accurately pointed out by Lieut. Bent, U. S. N., of the Japan expedition, at a meeting of the New York Geographical and Statistical society, in January, 1856.† He says: "This offshoot—the Kuro-Siwo, or

*According to Lieut. Maury, U. S. N., there are at least two other currents that issue from this ocean: "One of them is the well-known Mozambique current, called at the Cape of Good Hope the Lagullas current." "There is, at times at least, another current of warm water from the Indian ocean; it finds its way south, midway between Africa and Australia."—Page 137 Physical Geography of the Sea.

† Blodget's Climatology of the United States, page 29.

Japan stream—is separated from the parent current by the Bashu islands and south end of Formosa, in lat. 22° north, long. 122° east, and is reflected along the east coast of Formosa, where its strength and character are as decidedly marked as those of the Gulf-stream on the coast of Florida. This northerly course continues to the parallel of 26° north, where it bears off to the northwest and eastward, washing the whole southeast coast of Japan as far as the Straits of Sangar, and increasing in strength as it advances, until reaching the chain of islands southward of the Gulf of Yeddo, where its maximum velocity, as shown by our observations, is eighty miles per day." From the Japan islands, which correspond in their relation to it, to the grand banks of Newfoundland, it acquires a northeastwardly direction, and "attempts the great circle route to the Alentian islands." As it advances farther and farther into the Pacific, it slowly spreads itself out upon its common waters, and silently dispenses its higher temperature to the air and water around; and, finally, having reached its ultimate destination—the northwest coast of America—there, after a journey of seven thousand miles or more, exhausts its fertility, and, having accomplished its destined purposes, commences its circuitous return to the attracting centre. By far the largest part of this current thus turns down the American coast, the remainder finding an outlet as a surface-current, through Behring's straits into the Polar sea. The place of separation of the latter from this great whirl of warm water is the projecting extremity of the Peninsula of Alaska.*

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* So far as the ultimate distribution of this current and of the Gulf-stream reflects their original design, it seems that the latter was intended chiefly for distribution through the Arctic waters, or, in other words, for its ameliorating influence upon the climates of the seas, although also conferring benefits upon countries contiguous to its waters in their passage, whilst the former, from its limited access to polar waters, would, on the contrary, appear to be intended more particularly to recover the vast extent of land area, comprising the northwest of America.

Considering now the starting point of this current and its destination, the extreme difference of latitude between them, and the great distance to be travelled over; and knowing that the shortest distance between any two points on a sphere is "the arc of a great circle," we perceive that the course marked out and pursued by it is perhaps the shortest possible way, and just such as any other body would have pursued under the present physical requirements. Moreover, it will be observed that, at the various points of higher or lower latitude at which it strikes the American coast, a series of super-imposed, and to some extent, concentric arcs will be described of varying length and dimensions, according to the part of the coast taken. For instance, the arc described by those of its waters which first reach the continent in the latitude of San Francisco or Monterey would be less than that described by such as at first touch the British American coast; or than the arc described by the Japanese junk that was borne to the mouth of the Columbia river in 1831: just as, in like manner, the most southern portion of the great whirl of the Gulf-stream necessarily describes a smaller arc than that which first reaches the higher latitudes of the continent of Europe. The principle of action is this, that the shorter the distance between any two points upon a sphere, the smaller the arc described by any object in passing between them.

Furthermore, if this reasoning be correct, the lesser arcs of the current, possessing at the commencement the same temperature and travelling a shorter distance, would indicate at their termination a higher temperature than the greater ones; therefore, upon such parts as the waters forming them would impinge, a higher absolute temperature would be expected. We cannot assert positively that this observation has been actually verified by instrumental observations, for the record of sea-temperatures in the

Pacific is at present too incomplete, but as far as known they do tend to verify it—the sea-temperatures in the latitude of San Francisco being in the *winter season somewhat higher* than for several degrees above it, and *higher also* than the water *temperature* for *several degrees* below it *in the summer*. It is highly probable that the part of this coast just mentioned is that at or near which the lowest circles, or the southernmost layers of this Japan current, reach the American coast; a supposition well calculated to throw some light upon the phenomena of the ocean at this point.

Just here, we would venture another remark in reference to this current. It is well known that, in certain latitudes, the Gulf-stream does not preserve at all times a uniform width or possess uniform dimensions, but, being subjected to alternate pressure upon the right and upon the left, its two edges are made to vary their position. In the month of September, its northern limit is in close proximity to the Newfoundland shores; but in March, is removed several degrees of latitude farther south. The intervening space is successively travelled over "once each way during the year." This, then, is the free edge of the current, and has, therefore, a greater tendency to alter its position. With the China stream, however, by reason of its land-locked distribution and the want of a free northern escape for its waters, its southern limit becomes the variable one, and hence, the same causes operating in both cases, in March and September, the points of approach to the shore would also vary several degrees of latitude. In this, we believe, is to be found the true reason why *the warm waters of the winter months off the coast of California are supplanted in the summer by those having a lower temperature.* But we must reserve such observations as we design making upon this point

until the discussion of the alternation of sea-temperatures here indicated is directly in hand.

Westward of San Francisco, and bounded on the north by this current, is the ocean-expanse of its common waters, possessing the ordinary characters of oceanic-waters generally, a part of which forms also the centre of drift for the Pacific, analogous to the Sargasso sea, midway of the Atlantic. Between this mass and the smaller portions flowing southward along the coast of California there exists, at all seasons, a difference of temperature, to which we wish now to direct attention.

"During the winter," says Mr. Blodget,* "at sea, on the Pacific side, the absolute temperatures are at once higher than those of the land, and higher than in summer for two or three degrees of longitude next the coast. The thermal lines bend abruptly to conform to this difference' but *it is probable that, after changing position four or five degrees of latitude, they follow the parallels for an indefinite distance toward the central region of the Pacific ocean.*" Here, then, the isothermals, after leaving the shore, acquire a northward turn for several degrees of latitude, and then assume the direction of the parallels toward the heart of this great ocean. The general waters must then, at this time, have a lower degree of temperature than those next the coast. In the summer season, the order of things is reversed—the cold waters being nearest the coast, whilst the warmer ones are out from it. The same author remarks on this point as follows: "Taking the observations of the Pacific, in means for areas of five degrees of latitude and longitude, we find the areas westward of San Francisco to give 56° 5′, 62° 3′, 64° 4′, and 68° successively. The areas next southward, or between 30° and 35° of latitude, increase in temperature westward from longitude 120°, by the successive numbers of

* Blodget's Climatology of the United States, page 301. The italics are our own.

60° 5′, 63° 3′, 65° 7′, and 66° 7′, to the meridian of 140°. South of the parallel of 30° there are no summer observations on the coast. In the latitude of the Sandwich islands (20° to 25°), the temperatures increase from 72° at the meridian of 120° to 77° at that of 150° in the vicinity of those islands." (Page 278). The isothermals, upon reaching the water-surface, are at once depressed southward several degrees, and having passed the narrow belt of cold waters, rise again to the northward in pursuing their course to the interior of the ocean. It appears, therefore, that the waters which are subject to this alternation of temperature do not compose a part of the ordinary sea-water, properly so called, or as distinguished from the current under consideration, but that they are distinct and separate. The latter experience changes of temperature only as similar parts of other seas, in obedience to the nearer or more distant approach of the sun.

Again, we have already stated that a correspondence of circulation of the two oceans, Atlantic and Pacific (N), is more fully established on their western sides than elsewhere. The existence of a stream or current of cold water coursing along the Asiatic continent southward, between it and the China stream, fixes this similarity: this current is analogous to the returning cold waters between the Gulf-stream and the American continent, and has in view the accomplishment of the same objects. This, we feel authorized in saying, is that visible part of the polar waters which goes to supply the place of the great equatorial current, of which we have spoken. It is undoubtedly only a part of the masses dispatched for this purpose, and finds its exit from the Polar basin through Behring's straits as an under-current, or partly as an under, and partly as a surface-current.

Lieut. Maury says that "the surface-current flows north through Behring's straits into the Arctic sea," but Prof. Henry relates it as an interesting fact, which he acquired from Capt. Rodgers, "that an offshoot from the great whirl in the Pacific, analogous to that which impinges on the coast of Norway, enters along the eastern side of Behring's straits, *while a cold current passes out on the western side*, thus producing almost as marked a difference in the character of the vegetation on the two shores of the strait, as between Ireland and Labrador."* In either case, the result would be the same to us; if it enters the Pacific through this strait, even as a surface-current, the warm and lighter waters of the other would overlay it, just as occurs in the case of the Gulf-stream and its cold counter-current. Now, bearing in mind the fact that the only access of the Arctic waters to the Pacific ocean is by means of the limited capacity of this strait—limited in comparison with those performing a similar duty in the Atlantic, we may assume that wherever, in its northern area, cold currents are found, they obtain entrance through it, and may be taken as divisions of the under-current which there flows southward. An attempt to account for them in any other way, as by deep-sea currents from the south, would be contrary, in our judgment, to all the other actions of the sea, and violative of its harmonies.

Allusion has already been made to one such body of cold water in this ocean, not immediately traceable to, although undoubtedly derived from, the waters let in at this point. This is found off the coast of California during certain parts of the year, but is not of clearly definable limits. The mysterious character of this mass of cold water—lower in temperature, even in the summer months, than the waters in its immediate vicinity, and lower also than those by which it is supplanted in the

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* Patent Office Reports for 1855, page 363. The italics are our own.

winter season—is at present a source of much perplexity to climatologists and physical geographers. They recognize in its low temperature its unnatural influence upon land-climates; rudely define it; and refer it very properly to its great supposed head, the polar waters, but are at a loss how to account for its remarkable intrusion in the dry season of the Pacific slope: the rationale of its appearance at this time and place is unexplained. We have some reflections to offer upon this subject, and hope to be able to throw some light upon it.

We have already stated that its dimensions have never been determined, but the results of our investigations, with the aid of the published labors of others, lead to the conviction that its most northern point of contact with the shore is near the 41° of north latitude, and the direction of its northern or northwestern line of limit, if it can be represented by a straight line, is toward the point of Alaska. It probably extends southward on the coast-line about from seven to ten degrees of latitude, and in width, or extent from the coast, several degrees of longitude. In the subjoined note,* which contains an extract

* This is a recapitulation of certain temperature data which had been given in the ascent of the coast from San Francisco, lat. 37° 48′, to Fort Astoria, lat. 46° 11′, and contains also the conclusion as to the highest point of latitude at which the cold masses reach the continent.

"Let us recapitulate: From San Francisco, lat. 37° 48′, northward 2° 58′ to Fort Humbolt, we observe a continuation of the same reduced monthly mean temperature with a strict parallelism throughout the dry season. To this point the refrigerating influence appears to be about the same. Progressing 1° 58′ farther northward, to Fort Orford, we observe a sudden and material increase of 2°.70 per month over Fort Humbolt, for the summer season, and from June to September an average monthly increase of 2°.49; also a higher summer mean temperature by 2°.25. Then continuing 3° 27′ farther up to Astoria, we have an elevation of 1°.66 per month over Fort Orford for the summer, and a monthly average of 1°.05 from June to September. Hence, we see within a distance of two degrees of latitude a sudden elevation of temperature, amounting to 2°.70 per month for the summer, and within five and a half degrees of latitude, a monthly elevation of 4°.36 for the summer over Fort Humbolt, and a difference in the summer means of 3°.88. To what may this difference within so short a distance be attributed?

Now, perhaps we are better able to locate the northern edge of this cold current, and to appreciate the point near which its direct effects cease and where those of simple proximity begin. Fort Humbolt certainly falls within the range of its region of contact, for the slight and mere nominal differences that exist between it and places five or six degrees of latitude farther south afford positive proof of the fact. That it extends any distance above this point is exceedingly problematical, for an advance of not quite two degrees of latitude gives a much greater difference of temperature than has been noted for at least six degrees south of that point, and advancing five degrees from this point, such differences are observed as point to an almost entire absence of its influences, direct or indirect. It is likely that its proximity to the coast off Fort Orford largely affects its temperature distribution and prevents the more material and increased differences which would otherwise occur between it and Fort Humbolt. Besides, if we take as strictly true the remarks of Mr. Blodget, that this cold current passes "nearly due southeast" from the point of the Peninsula of Alaska, and estimates its breadth at seven or eight degrees of longitude (the distance westward from San

from an article presented by the author to the Medical Association of Georgia, at its annual session in 1859, entitled "An Essay on the Adaptation of Climate to the Consumption," etc., and including an investigation of the climate of the Pacific slope of the United States, may be found the principal circumstances that have induced us to assume the limits here assigned it, particularly its northernmost point on the coast.

In regard to the origin and track of this current, we believe the following explanation sufficient:

It will be remembered by those who are familiar with the physical geography of the Atlantic ocean, that the cold surface-current which enters it through Davis' strait, after meeting in its southward flow the Gulf-stream, becomes divided into two parts—one of which runs as a surface-current between the latter and the continent, and the other, becoming an under-current, underlies it, forming its bed, even to the Pass of Florida, it is thought. Now, in the Pacific, the cold waters enter principally as an under-current through Behring's straits, a part of which becomes the surface-flow along the Asiatic coast, while the remainder must continue an under-current, which will either lose itself gradually in its southward course, or, if proper conditions arise sufficiently far north, will rise to the surface. We can not say whether the China stream is underlaid to its ultimate source by the cold waters here obtaining entrance, as is the case with the Gulf-stream, but we do believe that at least one of the divisions of the latter is entirely overlaid by the

Francisco, which gives the reduced mean temperature), and establish its probable northern line of limit by this assumed direction and width, it will appear to approach the United States coast somewhere between Forts Humbolt and Orford, latitude 40° 46′ to 42° 44′. We do not presume that this northern boundary is as distinct from the waters beyond it as some may suppose, or even as distinguishable by the thermometer as the Gulf-stream is by the eye from its cold banks. Yet, if it can be represented by a straight line, that would, we are led to believe, extend from the point of Alaska to the western coast, at or about latitude 41° north. This, then, would bring within the scope or direct range of this current but an extremely small portion of the coast of Oregon, and, as has been intimated, show the position of this cold line to be "a little distance off at sea."—*Southern Medical and Surgical Journal, vol.* xv, *Nov. No., page* 731.

former during certain parts of the year, and but partially at others, having, during the latter, found those proper circumstances to which we have alluded, admitting its appearance upon the surface.

Incidentally, we would add, Lieut. Maury states that this strait is too shallow to admit of "mighty under-currents;" and as the Pacific waters in their greatest bulk do not escape through it, but return toward the equator—thus supplying a southward flow—there is no necessity for such "mighty under-currents" as might otherwise be expected. If we assume the amount entering this ocean by means of this under-current to be equal to that escaping from it, it must appear insignificant in comparison with the amount borne northward by the China stream, and therefore can not be intended as a full supply for that withdrawn from the Indian ocean.

As to the causes of a division of this under-current from the Arctic sea, we may remark that, besides the lighter properties of the warm southern current, which preserves a part of it as a deep-current, the physical obstacles—the Alentian islands—between which its waters have to pass as through the meshes of a sieve, are themselves sufficient to divide it, and to promote a wider separation of those divisions. This being effected, and the subdivisions being now, as it were, unrestrained in their southern tendency, would select such routes as are most favorable to a direct passage. Thus we may suppose that those upon the right would tend toward the Asiatic coast, whilst those upon the extreme left would be led to seek a more direct or shorter pathway to the south, along the American coast. More than this: do we not see, in the presence of those numerous groups of islands which are crowded together so thickly in the southwestern part of the ocean-area, another obstacle calculated to aid in determining the course of the latter

branches? It may be that the capacity of the ocean, in that portion of it, is so fully taken up by the remarkable current that we have considered, and so far encroached upon by these islands, that the great body of under-moving cold water can not accompany the China stream, with its channel as a guide, to the southern sea. In other words, by reason of the shallowness of this part of the ocean, as indicated by the island-areas, the great channel, so to speak, for the southward flow of arctic waters, is thrown partly along the American continent. These several circumstances tend, in our opinion, to point out the reasons for the adoption of the course pursued by that branch which at times wells up to the surface on the coast of California. The well-known fact that the Gulf-stream and its underlying cold bed occupy the deepest part of the Atlantic ocean is, to some extent, corroborative of the supposition that this left-hand branch is seeking a deeper channel.

But why, it may be asked, should this current make its appearance upon the surface on this coast during the summer months alone, and why its disappearance in the winter? And in answer to this, we must be allowed to refer again to the analogies of the Atlantic ocean. We have spoken of the changing limits of the Gulf-stream: what were the instrumentalities by which those changes were effected? We can not do better than to give the language of the great expositor himself:* "Therefore, though the waters of the Gulf-stream do not extend to the bottom, and though they be not impenetrable to the waters on either hand, yet, *seeing that they have a waste of water on the right and a waste of water on the left, to which they offer a sort of resisting permeability, we are enabled to comprehend how the waters on either hand, as their specific gravity is increased or diminished, will impart to the trough of this stream a vibratory*

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* Lieut. Maury: Physical Geography of the Sea, page 44. The italics are our own.

motion, pressing it now to the right, now to the left, according to the season and the consequent changes of temperature in the sea." Here is the manifest reason for the appearance of these waters at this season at this place. As soon as the sun crosses the equator and commences his course through the northern hemisphere, in March, the vast ocean-mass in the interior, and standing off a few degrees of longitude from this coast, begins slowly to imbibe heat, which rapidly increases to the summer months. In proportion as it becomes elevated in temperature, its specific gravity is altered and its expansion produced; and by reason of the consequent pressure upon the free southern edge of the warm and resisting waters, the latter is forced several degrees of latitude above its lowest winter position. As this northward displacement of the warm waters is taking place, the cold masses, which have heretofore been pursuing their silent course as an under-current, lift themselves to the surface at such points in their pathway as have been relieved of the superincumbent warm waters, by reason of a lower specific gravity than the common sea-water. Their specific gravity, then, though greater than that of the great western current of warm water, is nevertheless less than that of the common sea-water, by virtue of which they rise to the partial displacement of the latter. It may be that these three different bodies or classes of water are identical in character, though not superimposed one above the other, with the stratified layers of the Arctic sea, as reported by Commodore Rogers:* "His observations show uniformly this arrangement or stratification in the fluid masses of the Arctic ocean—warm and light water on the top, cold water in the middle, and warm and heavy water at the bottom." Just as long, therefore, as the present relations are sustained and the

* Smithsonian Report for 1856, page 349.

pressure maintained, just so long will the cold masses continue as surface-waters. And this is found to be the case, for throughout the months embraced in the dry season of California—the period of increasing heat—they are present in some degree, and are felt in some measure in their chilling influence.

On the other hand, as the sun retreats to the southern hemisphere, carrying with him his warming influences, the sea-water slowly reduces its temperature, contracts upon itself, and recovers its lost winter specific gravity; and with these changes gradually withdraws its pressure, consequently the free edge of the warm current again returns southward, overlying the cold ones, and causing their disappearance. Hence, in the winter season, the cold ones have been entirely supplanted by those warmer and lighter. In these various modifying and forming circumstances is also seen the reason of the indistinct and indefinable limit of this body of cold water. It is simply a remarkable intrusion of cold water in the summer, irregular in outline and transient in duration. The limit of the northern edge of the Gulf-stream at certain latitudes varies, from March to September, from five to six degrees of latitude (from 40°–41° to 45°–46° at "the meridian of Cape Race"), and this, we think, is about the extent of variation of the southern edge of the warm waters in the Pacific. The variation of the former, off the grand banks of Newfoundland, "is, as the temperature of the waters of the ocean changes, first pressed down toward the south, and then again up to the north, according to the season of the year." The same is true of the other, and, except as a result of scientific inquiry, would be as little thought of, were it not for the unnatural impressions made upon us by its occurrence in the summer season; and this last, we the more readily perceive, because its refrigerating character is made more sensible to us in consequence of

the aid furnished by the general atmospherical circulation which drives the air inland. On the Atlantic side, the Gulf-stream's variations, or the nearer and more distant approach of its warm waters to the Newfoundland shores, and the subsequent substitution of cold waters for them, are of little consequence, because the westerly atmospherical movements bear its influences from us, and, as is the case, we would seek no knowledge of it, as we have said, except as a scientific fact, and as a curious feature in the history of the Gulf-stream.

Passing now to the last clause of our subject, we would remark that we propose simply to indicate the *general* influences of these peculiarities of the Pacific circulation upon the climate of the American coast, and not to attempt a minute examination of them. The latter, as far as the present record will admit, we have already done in the essay before referred to, to which we would respectfully refer our readers.* Moreover, in our notice of the general influences, we shall be very brief, and shall, at the same time, draw from the writings of others.

These general influences are not difficult to trace, for the warm waters of the China stream, coming full upon the extreme northwestern part of the continent, confer upon its immediate coast features similar to, and to some extent identical with, those conferred upon the corresponding latitudes of western Europe by the Gulf-stream. The difference of the results of the two currents, or the loss of a positive identity of effects, results from the greater loss of temperature sustained by the former, by reason of the greater width of the Pacific ocean: the difference, however, is one of degree only. Wherever these waters strike the coast they exert a softening influence upon its climate, by mitigating the severities of the winter season and by elevating to some extent the summer heat, in the

* Southern Medical and Surgical Journal, Vol. XV, commencing with the May number.

higher latitudes; and withal, tend to the preservation at all times of a comparatively uniform temperature condition.

"North of the 45th parallel," says Mr. Blodget, "the cool, humid summer of the west of the British islands and Norway exists, with apparently no great measure of difference in like latitudes. It is little known as yet, except on the coast of Oregon and at Sitka, but where not shut in by rugged mountains it is very favorable, at least to the 55th parallel. Vancouver's island is peculiarly favored, and its area is large enough for a flourishing state. It is said that here the summer is warm and productive, and that all branches of agriculture common to the latitude, 48° to 52°, in Europe flourish whenever undertaken. It cannot be otherwise than that a large area of valuable lands and favorable climates extend between this point and Sitka, at lat. 57°. At this last point, the saturation becomes excessive in summer as well as at other parts of the year, and there is almost constant cloudiness and rain. Richardson says that 'the climate of Sitka is much warmer than that of Europe at the same parallel, but the atmosphere is charged with vapors, whose condensation occasions almost constant rains. In the month of July, the sun is seldom visible more than three or four days, and then only for an instant. The humidity gives astonishing vigor to the vegetation, yet corn does not grow there; and, in fact, the want of level surface is an impediment to cultivation.'" Some idea may be had of the excessive vegetation, when we consider the size of the pine and spruce trees grown here, as given by the same author: they attain "a diameter of seven feet, and a height of one hundred and sixty feet." The productive capacity of the region, however, is not so extensive. It is said that "along all this immediate coast Indian corn, the characteristic American staple, fails to

come to perfection, and at the greatest exposures will not grow at all. In the valleys opening to the sea it will often grow a slender stem of nearly full height, but with no tendency toward formation of grain. The summer at Vancouver's island is more favorable to it than at Monterey, thirteen degrees of latitude southward, though it is believed that it is scarcely cultivable at the first locality—at least its cultivation there does not appear in notices of the islands."

In regard to the correspondence of the temperature condition on this coast and along the west of Europe, the same writer (Mr. Blodget, page 209) continues as follows: "the identity of the two west coasts in regard to climate may require the citation of some statistics in this connection, to establish it. In latitude there is little difference between the southwest of England and Vancouver's island, and the correspondence of climate is quite decided. Though we have no instrumental observations at the last point, we are informed by navigators that there is little frost in winter, and that vegetation advances rapidly in February and March. The whole climate, indeed, is peculiarly soft, equable, and *English*. It is such on the coast of Oregon and California as has been described, and particularly at Sitka and the upper intervening islands. In the statistics the same low curve of differences among the months, and the same low range of variation for the day, belong to both." "The average ascending difference being 4°.2 for each month at London, and 4°.4 at Steilacoom, the most nearly corresponding American position. At Paris this average is 5°; at Sitka 3°.8, and at Fort Ross only 1°.88".

This is, perhaps, sufficient to convey a general idea of the character of the climate, at all seasons, north of the latitudes which are the seat of the alternating warm and cold masses of water. The latter comprise the coast of

California and a small part of Oregon. During the winter, or wet season, of the Pacific slope, in which the warm waters circulate off the entire coast, the same general features are continued to the more southern part—due allowance being made for the difference of latitude. Thus at this season the mean temperatures along the coast are brought very nearly to the means of the water-temperature, and a degree of uniformity and regularity of temperature maintained, that, in some of its parts, is without a parallel in the eastern United States. So great is the consequent uniformity that, with the aid of the altitudinous interior of the Pacific slope, "the decrease in the mean is but ten degrees for fifteen degrees of latitude, from San Diego to Astoria, or two thirds of a degree of temperature to one of latitude. Continuing to Sitka, there is a diminution of six degrees of temperature for eleven of latitude, or nearly the same proportion;" and "of isothermals differing five degrees, but three can be made to cut the Pacific coast from San Diego to the 49th parallel."*

But in the summer, or dry season, of the southern part of the Pacific coast, the refrigerating influence of the cold waters circulating off the coast is so great that the climate is rendered exceptional, and its various mean temperatures are reduced below those higher up on the coast of Oregon and Washington territory. The effect of this mass of cold waters upon the adjoining land-area is greatly enhanced by the configuration of the continental mass itself: the close proximity of the San Joacquin and Sacramento valleys to the sea, with their furnace-like temperatures, is the chief element of the latter. As the temperature increases in these valleys with the approach and progress of the dry season, and simultaneously with the

* On the Atlantic coast, the temperature diminishes "at the rate of two and seven tenths degrees of the thermometer to one degree of latitude—a ratio, in comparison with that of the Pacific coast, of more than four to one."—Army Meteorological Register, page 710.

rise and influence of the cold waters themselves, the impressions of the latter are more perceptibly felt. So that in the summer months the greatest intensity of action of the latter is manifested, and so great is it that, at certain points of the intervening coast structure, the mean temperatures of the summer months indicate but a slight advance over the spring means, and the first fall month affords the highest monthly mean for the year. *

The indraught of the cold atmosphere of the Pacific in this latitude is the result of the combined agencies of the heat of the interior valleys and the cold off the coast. And where these conditions obtain, the remarkable fact that we have alluded to is produced—that the means of the summer months at places from two to fifteen degrees farther north are above them. The positive reduction of temperature along the coast of California would be an interesting fact, if it were possible to determine it; but an approximate calculation made by the writer in the essay already quoted from, in which the most exposed point of the coast, San Francisco, and the temperatures at Fort Miller, in the interior valley, were taken, gave an

* Some idea may be formed of the degree of refrigeration experienced at such points by the following extract from our former article: "At San Francisco, we find the mean temperature of the month of June, so great is the influence of the sea, reduced virtually to the temperature of the latter (the sea-temperature 56°.5), there being a difference of only 0°.36 in its favor. This influence of the sea-temperature is still farther exhibited in the trifling increase of July over June, the advance being only 1°.04, and over that of the sea itself only 1°.40. August, again, while it recedes 0°.68 from the mean of July, is yet 0°.36 higher than that of June, and only 0°.72 higher than the mean water-temperature. September, instead of manifesting a decline in its mean temperature, when compared with the last two summer months, at San Francisco, as is also true of Monterey, shows the highest mean temperature of the dry season along the coast of California." "Comparing it with the mean of the sea-waters, it is 1°.76 higher in its mean temperature."--(Southern Medical and Surgical Journal, vol. xv, July number: An Essay on the Adaptation of Climate, etc. By the author.) And again, when comparing the Pacific coast with the State of Florida: At San Francisco, "the whole amount of augmentation of temperature during the entire period from April to September, as evidenced by the difference of their means, is only 2°.89. May, instead of giving a mean from 4°.72 to 6°.94 above that of April, declines slightly from it, and June only increases over May so far as to exceed the mean of April by 1°.49; from June to July, the increase is only 1°.04, whilst August retreats so far from July as to make its mean only 0°.36 higher than that of June; and, finally, September gives a mean of 1°.04 above that of August, but only 0°.36 over that of July. The entire period of a declination of temperature occupies here a single month, and amounts to only one third of a degree. By this nominal decline, the month of October presents the same mean that July has. Hence, an unparalleled uniformity of temperature-condition exists here from April to October. At other places on the coast of California, similar, though not identical results are manifested, and for some degrees of latitude, both northward and southward of San Francisco, a corresponding uniformity is observed, so that the advance of temperature, during the summer, amounts to only "one degree for one hundred and twenty miles northing."—Southern Medical and Surgical Journal, vol. xvi, February number; same article.

average reduction at the first of 28°.97 per month for the summer season. Finally, it thus appears that the relation which these peculiarities of the Pacific circulation sustains to the climate of the contiguous shores is a controlling one—endowing each season of the climatic year with the features common to the particular current then present off the coast. Moreover, the climate of the immediate coast in the dry season is subdivided in such a manner as to create the lower mean temperatures in the southern latitudes, and the higher in the northern, during the summer months proper.

In conclusion, while making a free acknowledgment of the liberal use of the labors of others, we would remark that we have only been induced to record our reflections on this subject by the remarks of Lieut. Maury, that "'stay-at-home travellers,' as well as those who 'go down to the sea in ships,' are concerned in the successful prosecution of the labors" involved in a scientific study of the sea. And the writer trusts to the shield thus generously thrown by this encouraging call over the apparent presumption of one who is practically but little acquainted with the sea.

Compound Fracture of the Os Femoris healed in four days. By L. A. Dugas, M. D., Professor of Surgery in the Medical College of Georgia.

Capt. A. D., about twenty-two years of age, was wounded on the 21st of August, 1864, near Winchester, Va., in the battle of Summit Point. The missile, supposed to be a minnie ball, struck him on the left side of the scrotum, and, passing between the testicles, entered the right thigh, fracturing the femur near the junction of the upper and middle third, and remaining in the limb. The wound being considered mortal, he was carried to a neighboring house and left there with a cold-water dressing, but without being splinted.

On the fourth day the wound in the thigh was entirely healed—no suppuration having taken place. On the 19th of September the fracture had united sufficiently for him to undertake the journey to Augusta, Ga., without a splint. Upon his arrival here (27th Sept.) I visited him, and found that the fragments of the femur had united, with some overlapping and a shortening of two and a half inches, but no other deformity. The captain related to me the history of his case as now written out.

The wound of the scrotum proved very painful; one of the testicles became much swollen, and he suffered severe attacks of neuralgia along the spermatic cord, on his way home; but when he reached here all was well. He subsequently suffered again several attacks of the neuralgic pains.

May 20, 1866.—Capt. D. informs me that, during a recent visit to the seaboard, he had an abscess formed, which opened at the orifice of entrance of the missile in thigh, but that it soon healed without discharging any foreign body nor fragment of bone. He states that it was carefully probed by a skillful physician, who ascertained that it did not communicate with the bone nor ball.

The captain is now (Nov., 1866) in fine health, and feels no inconvenience from the presence of the ball.

This case is remarkable as an illustration of union by first intention in a gunshot wound of the thigh, and of the successful treatment of an important fracture without the use of splints nor of any other retentive appliances. Every one must have observed with what facility fractures become consolidated in the lower animals without the interference of art. A fracture of the leg in a cow came under my observation, which, although causing the limb to dangle loosely for some time, ultimately united without leaving the slightest deformity. Such facts teach us, at least, that it is not absolutely necessary to prevent all

motion between the fragments in order to secure their union.

I may be permitted to relate another case of

Gunshot wound which healed by first intention.

In 1862, Mr. J., a young man, twenty years of age, was handling a small pistol, when he accidentally shot himself through the palm of the hand. No bone appeared to be broken and there was but little hemorrhage; yet the blood continued to flow, and seemed to be arterial. I applied a thick compress, wet with cold water, to the palm of the hand, and bound it down firmly with a roller bandage, which closed the dorsal orifice of the wound also. The dressing was ordered to be kept wet with cold water and the hand placed in a sling. On the fourth day, I removed the dressing and found both orifices healed without the least evidence of suppuration. The dressing was, however, reapplied and worn for eight or ten days longer, merely as a measure of precaution. No deformity resulted.

Report of a Compound Fracture of the Femur uniting without suppuration. By DESAUSSURE FORD, M. D., Professor of Anatomy in the Medical College of Georgia.

C. Rollins, of the army of Northern Virginia, nineteen years of age, athletic, of sanguine temperament, weighing 160 lbs., a farmer, was wounded in the first battle of Manassas, and removed from the battle-field to the General hospital at Culpepper Court-house, Virginia.

The ball entered behind and below the left trocanter major, fracturing the femur, and was found in the abdominal walls, in the middle of the inguinal region of the opposite side, from whence it was extracted. The foot was extremely everted, and after being straightened,

if released, would resume the unnatural position; crepitation was distinctly felt during these movements. The shortening was half an inch. I saw him a week after the injury, and so slight, almost imperceptible, was the swelling; the wound of entrance healed, no discharge of pus ever having been noticed, and only complaining of pain when the limb was straightened. I hesitated to interfere, as by this early union of the soft parts the fracture was converted into a simple one. On the tenth day, however, I straightened the limb, and applied extension by attaching a light brickbat to the foot, by means of a bandage, which passed over a railing at the bottom of the bunk, allowing the weight to hang near the floor, and a long splint, extending from the foot to a point six inches above the iliac crest, adjusted to the outside of the thigh by interrupted bandages. The weight of the body acted as a counter-extending force.

Six weeks after the injury he was furloughed—the fracture having united without any suppurative inflammation. There was slight eversion of the foot and shortening a quarter of an inch after the treatment was completed.

The extracted ball was rough and jagged, the symmetry having been so destroyed with difficulty it was determined to have been a round ball. The minnie ball striking a long bone usually splinters it, causing fissures which extend many inches above and below the point of contact; whereas, a round ball, projected by a musket, generally merely fractures the bone, the solution of continuity being comparatively limited. It was the experience of many Confederate surgeons that compound fractures of long bones, caused by round balls, resulted much more favorably than those produced by the minnie ball.

On the Action of Fungi in the Production of Disease. By Dr. TILBURY FOX.

[There are many questions connected with the action of fungi in the production of disease which are most interesting as well as important. Thus it is questionable whether these so-called parasites are vegetable or not in nature, and whether they are distinct species, or only varieties of one species. It is now admitted by all that the fungi are really of a vegetable nature, and that their germs are derived from the exterior.]

The mode of entry of the Fungus into the system.—There is no difficulty in accounting for the access of germs to living bodies, for these germs are freely distributed and disseminated in the air. The best illustration of this fact may be noted in the experiments of M. Bazin (Gazette Méd. de Paris, July 30, 1864), which consisted in passing currents of air over the head of a favus patient, and thence over the open mouth of a jar containing ice. The ice cooled the air, causing the deposition of moisture, in the drops of which the achorion sporules were detected. The same thing may be shown by holding a moistened glass slip near the head of a patient, and just rubbing his scalp freely. Of course, actual contact is much more effectual in the implantation of germs. But, without delay, let us suppose that the sporular elements find their way to the human surface; how get they deeply into the tissues? In various ways, probably. Let us take a general sketch. The greater the degree of moisture and heat, the better is the chance of entrée.

First of all, the fungus elements may enter by fissures or natural orifices; for example, in ordinary ringworm the sporules lodge themselves at the opening of the hair follicles, and presently get beneath the epithelial scales. We shall see, directly, how. A great many experiments have been made at different times, upon this point, in the case of plants. De Bary (Die gegenwartig

herrschende Kartoffelkrankheit, ihre ursache und ihre Verhutung, Leipsic, 1861) found that, in terminal filaments of potato mould, so-called zoospores were formed, which bud, protrude filaments forming a mycelium which has the power "of penetrating the cellular tissue in twelve hours, and when established there it bursts through the stomata of the leaves." This "boring" operation is quite likely to occur, especially where the structures are diseased; as, for example, the muscardine in silkworm, in diseased mucous surfaces or epithelial changes; here the entrance by continuity is easily accomplished by the growing filament. It has been supposed that mycelium may get within the shaft of the hair, in some part of its course, in this way. I do not believe it. If a fungus finds an entrance, it is either through a cut end, a distinct fracture, or, what is usually the case, the soft, growing root. A good deal of doubt has been expressed as to whether the spores could find their way into the interior of plants through the stomata. It seems pretty clear that the latter are not sufficiently large for the occurrence. There can be no question, however, that, in a large number of instances, the spores send out little processes, which get into the plant through the stomata. Here the recent experiments of De Bary help us again. They are noticed by Mr. Cooke, in his admirable popular work on microscopic fungi. The observer took a large number of common garden-cress plants, placed their roots in water containing zoospores, and though the former became covered with these latter bodies, yet not a jot of evidence of penetration occurred. De Bary, however, found that if the cotyledons, or seed-leaves, are watered with fluid containing zoospores, that slender tubes put out by the zoospores enter the stomata, the terminal ends enlarge, branch out, and become the centres from which a ramifying mycelium is produced, which presently

shows itself externally. De Bary tested 105 plants in like manner and under similar circumstances, with water free from zoospores, and without the production of any sign of rust in these. De Bary concludes that plants are not infected by spores entering through the roots or leaves, or through the medium of the seed-leaves of cotyledons. But it is probable that the fluid contents of the spore-cells may be absorbed and give rise to disease. The Rev. Mr. Berkeley, several years ago, found that the germs of bunt placed in contact with seeds infected them, without there being any evidence to show that any spore or mycelial thread had effected an entrance. It seemed as if the granular fluid contents were taken up by the plant and caused mischief. It is possible that minute threads might have penetrated the seeds nevertheless. There is, however, no difficulty in supposing the granular contents of spores (sporules) capable of reproducing the typical spore. But, in the next place, there can not be a doubt but that in the human subject the germs of the fungus find their way to the roots of the hairs, and are carried bodily upward into the shaft in the process of growth, developing as they go, till at last they degenerate and break up the fibrous structure in which they are. By analogy we should quite expect that such a thing is possible, and, indeed, of frequent occurrence in the case of the tender roots of plants; and this is more likely to happen when the contents of the original spore (which is as large as the spongiole cell) happen to be discharged by bursting. Moreover, it is quite clear that the germs of parasites enter at a much earlier period than we are apt to imagine, and lie dormant, brooding mischief till the favorable opportunity arrives. De Bary proved this in the case of the white rust (cystopus) which hybernates, as it were, in the sub-epidermal structures during the winter, till the spring arrives. In addition,

the fungi "make head," so to speak, into structures in virtue of the chemical action which they set up. This is best seen in the hard structures of animals. Carbonic acid is given off at the terminal cells. This dissolves the lime of the shell and allows the parasite to effect an entrance most easily. The experiments of Wittich, quoted by Robin, all tell in the same direction. Panceri has come to the conclusion, however, that, in the case of the egg, the minute germs effect an introduction through minute microscopic holes which exist in the shell. *Lastly*, traumatic lesions afford an easy channel for the conveyance of fungi to deep structures. This is what happens in the mycetoma or fungus foot of India.

We have then, as modes of entrance—(1.) That through natural orifices; (2.) That in which the growing force forces the mycelial thread beneath the layers of the superficial tissues; (3.) That in which processes shoot out from the spore and enter by such openings as stomata; (4.) That where the cell contents are absorbed; (5.) That in which the spores are carried bodily inward by growing parts; or (6.) dissolve away the opposing structures by chemical action; or (7.) enter by traumatic lesions. In each and every instance the germs of parasites are derived *ab externo* and not generated *spontaneously*.

There are some special circumstances that deserve comment. It has been asserted that microscopic entophytes have been discovered in close cavities utterly cut off from communication with the external air. But these instances are open to grave objection; fungi have been found in the fluid of the ventricles of the brain, which, however, was allowed to stand all night exposed before it was examined. Again, it is asserted that in the kidneys the like has been found. This is open to exactly the same objection. The case of the egg parasite has been explained away by Panceri; and it has yet to be shown,

supposing the urine has ever during life contained fungus elements, that air can not enter the bladder. The case of germs of vegetable nature in the blood-current presents some difficulty; but even here the most considerable caution is needed. We know that fungi spring up with enormous rapidity; and it must be proved that those spores and mycelia are present at the moment of death, nay, during life, before we can give credence to any theory which asserts that they have been present and introduced during life, and not by a communication with the external air. It is still a question whether the endosmotic action of the villi may not be able to account for the presence of cryptogams in the blood-current. As far as the facts of vegetable parasitism go, we are bound to deny any such occurrence. And, upon analogical grounds, I venture to assert that the entozoa found in muscle, which have lately caused no little sensation, are not vegetable in nature. Should they be proved so, it will entirely alter the whole subject of vegetable parasitism: for we are justified at present in asserting that there is probably no known instance of a growing plant in any situation not in direct or possible communication with the air. I am bound to say that Dr. Thudicum believes in the vegetable nature (see Report of Medical Officer of Privy Council for 1865) of the rinderpest entozoa (?).

I pass to the consideration of the part played by fungi in diseased states. Two theories the most opposite in intention have been held by writers and others, so opposed that really the conclusion is forced upon one that both *must* be wrong and a middle belief correct. Whilst one batch of inquirers affirms that parasites are accidental, another contends that they are the essential cause of those diseased conditions found in "association" with their growth. Ehrenberg, in speaking of organized parasites at a time when the exact nature of many of them was

indistinctly recognized, said "that there is more cause for wonder at the limitation of their effects by the actions of living bodies they inhabit than at any morbid effects they appear actually to produce." It must first of all be noted that there are certain conditions which are peculiarly favorable to the growth of vegetable parasites. The latter are ubiquitous, capable of resisting the action of heat, cold, and decomposition, have a tremendous and rapid power of increase, and will remain for a very long time in a state of inactivity; yet, notwithstanding all this facility, there are certain states of organisms against which they fail; which will somehow resist their inroad and attacks; and it is now clear that though parasites may for the moment get a temporary hold, yet they will not flourish upon a typically healthy surface. This is a fundamental truism that must be observed in reference to therapeutics. For rusts and mildews prevail in direct ratio to the wetness of the season, or after drought, as in the pea or hop; damp itself is very favorable, and where there is much drought the vigor and the circulation of plants are diminished very considerably. When plants are very ripe also, there is a less degree of vitality present, in consequence of the cessation in great extent of the circulation and vital connection between the fruit and the stem. The same thing holds good in every instance where animals, plants, or men are attacked. We may instance the case of muscardine. The experiments of Claude Bernard also showed that frogs kept in captivity got out of order, and aphthous conditions arose. A healthy frog brought near its diseased fellows "set contagion at defiance," but unhealthy frogs were at once attacked by the vegetation flourishing on the aphthous surfaces of others; and the case of favus in man, or scab in sheep, of which an account may be seen in the *Gardener's Chronicle* for April 24, 1864, is illustrative of the fact under notice.

There is always a certain resistant power about all healthy living beings; and a certain amount of fungus, however it acts, may be present without giving rise to what one can possibly call disease. In young life, of course, one would expect that fungi would obtain a hold more effectually than in old life; and it is very remarkable that the white rust before referred to, according to De Bary's experiments, should effect an entrance into the system of the garden cress, by attacking the young leaves or cotyledons. The young and tender stage becomes an easy prey; and this is exactly what we find in the human subject, the young being most liable to ringworm.

Taking all things into consideration, it is clear that parasitic disease—or, as I have named it generically, *tinea* —can not be explained by either of the conflicting theories I have referred to, but consists of three distinct components, which must be recognized, if the physician would cure his patient well and quickly.

1. A certain state of soil: in speaking of polymorphism of fungi, I noticed that each fungus appeared to require each its special kind of pabulum.

2. The access of air, and the presence of heat and moisture—the conditions necessary to support the life of fungus. And,

3. The introduction from without to and action upon the body of the vegetable germs.

The first and second will be passed over without comment: my remarks are specially intended to define the action of the parasite in the production of diseased states. Now, fungi are not "accidental" and unimportant, but act in several distinct ways when once they take hold and grow upon the surface. This is important; if we insist upon some *one modus operandi*, we shall assuredly find our position utterly untenable. They act then (often in more than one way in the same instance be it remembered):

Firstly, mechanically.—If you simply rub into the surface some of the fungus elements, in many cases you get what we know as irritation. This is seen in the ordinary herpetic ringworm of the surface, where the mycelial threads range over the skin beneath the epidermis and lead to erythema, etc. A very remarkable case is recorded by Dr. Kennedy, of Dublin, in which a quantity of flax powder was inhaled by a lad who became attacked with measles and peculiarly severe local dyspnœnal symptoms, evidently dependent upon the direct mechanical irritation exerted by the fungus elements. In the case of mildew of plants, the same thing is seen—the threads of the mycelium grow, and force asunder the tender structures near it. Now, it is this mechanical action exerted by the growing force which is at work, especially in ringworm. The fungus finds its way to the sub-epidermal space, from thence to the hair follicle, irritating and interfering mechanically with the growing parts, enters into the hair, and by its increase and development simply splits up the hair-shaft, appropriating also its juices, and rendering it all the more brittle, and therefore the more easily destructible. To declare in such a case that the parasite is accidental in any sense of the word is to turn a deaf ear to the plainest voice of facts; but this very action can be isolated. I have performed a good many experiments at different times with diseased hairs out of the body, and occasionally it is possible to get a hair containing spores, which spores will germinate and actually produce the splitting up of the hair, and the other changes that are observed in ringworm—in fact, *to produce the lesion of ringworm out of the body.* In those instances in which the mycelium abounds, the epithelium seems to suffer particularly. On the mucous surfaces there are no such structures as hairs which form a lodgment, so to speak, for the fungi, and hence no marked

results are visible. The cells of the tissues are invaded and destroyed, the mycelial phase abounds and ramifies in the secretion, and not in the tissues themselves; but there is the same *capability* of damaging when parasites attack only the internal surfaces. If we would wish for examples of the enormity of the force exerted by a growing fungus, we have only to confine some of the more ordinary varieties and see the result. Now, it so happens that no other agent can produce in disease the same kind of action as that exerted by a growing fungus—such as splits up the hairs in the way in which this is observed in tinea; and it is this state of things which I regard as the pathognomonic lesion of ringworm, viz.: the mechanical action of the parasite upon the hair and epithelium in connection with other minor changes.

One word as to definition. I use the word tinea as the generic term, and particularize each variety by the terms favosa, tonsurans, sycosis, vesicolor, circinata, etc., the tinea signifying especially the diseased state of the hair and epithelium. Now, take the case of sycosis, which means inflammation of the follicles of the chin and lips. It may not be caused by a parasite; but undoubtedly cases are sometimes caused by a fungus, and these I called tinea sycosis. Again, tinea circinata means the parasitic herpes circinatus, and tinea decalvans the baldness produced by the fungus (microsporun Audouini), as distinguished from alopecia, non-parasitic baldness, the result of many different causes. The term tinea is very distinctive.

Secondly, Fungi act by inducing local chemical change.—They absorb oxygen and give out carbonic acid; and, as has been before observed, they hereby secure to themselves the power of penetrating calcareous structures. In addition, a large amount of gas is evolved as in cases of sarcinal disease. Moreover, they lead to fatty degenera-

tion. If any one will take the trouble to examine carefully some of the old stubs in favus, he will notice a certain amount of fatty changes going on in the cell structures. Remove a hair of this kind loaded with sporules, and get the latter to germinate, and the fatty alteration goes on at a rapid rate, till after a time a large quantity of crystalline fat is produced. Now, this will not happen unless the fungus germinate; but happening, it is worked out in accordance with the views lately put forth by Dr. Bence Jones, and was expressed in precise terms in my book on parasitic diseases. It has been remarked by many observers that fat is always present in considerable amount in connection with the development of fungi. M. Signol believed that fat very much favored the development of bacteridia. Perhaps the very best exemplification of the association of fatty change with parasitism is that afforded by the case of the madura foot, where the oily matter is so very abundant. The tissues degenerate, and the crystalline fat is so varied and peculiar as to have actually misled observers into the belief that it was a form of fungus. Now, it becomes a question whether fat assists the development of fungi, or whether the latter attract fatty matter, the fungus forming a center of attraction for crystallization, or the fatty change be the result of cryptogamic growth. I adhere to my original belief, and Dr. Carter is of the same opinion, that the fatty change is coincident with, and a consequence of the growth of fungi. Nitrogenized and other matter becomes fatty in this way very readily. Of course, under such circumstances, the fungi become a center of attraction for the fat. It is a chemical action entirely, as far as the degeneration is concerned; a process of oxidation which the fungus induces under favorable circumstances, in connection with the performance of its own vital functions.

Thirdly, Fungi act as conveyers of poison.—This is a mode of influence which has been altogether disregarded by observers. If the endogenous pus-cell can convey the noxious poison of an acute disease, why may not the elements of a fungus act in a similar capacity? Recent research has shown that all fungi exhibit great transportability. Now, what action have the cells afloat in the air of hospitals during the time of epidemics, such, for instance as cholera (see Dr. Thomson's Observations at St. Thomas' in 1854); may they not take the virus of a hospital gangrene from one patient to another, acting the part of a fomes in the very same way, comparatively speaking, that man himself does? Suppose we inoculate with fungus elements, it is clear that in some instances symptoms ensue (as in Dr. Kennedy's and Salisbury's cases) before the onset of local symptoms. Again, the fungus elements would appear to be most active in their early stage, that is to say, when the poison produced simultaneously with their development is in its freshest and most active condition. Again, respirators in epidemics have been found to be efficacious. And, lastly, direct experiments, upon plants especially, have shown that disease may be produced by the contact of fungus elements, when there is not a particle of evidence to prove that sporules, spores, or mycelial threads have entered the organism of such plants, but where there is the greatest probability that the granular and fluid contents may be the poisonous compound which, when absorbed, gives rise to the subsequent malady. It is not unlikely that in catarrh and influenza especially, such a conveying property may be at work. We have the strongest possible amount of analogical evidence in regard to animal life, comprehended in all the details of the "animalculæ theory of disease"—a doctrine that may be pooh-poohed by some, but which must ere long be fairly

discussed. One might give a great deal of very interesting matter under this head. Those who are interested in the subject should read Sir Henry Holland's article, in his Medical Notes and Reflections, 4th edition, I think, on the Animalcule Theory of Life, and to Dr. Daubeny's essay in one of the volumes of the *Edinburgh Philosophical Journal*, some few years back. The occurrence of epidemics, be it noted, moreover, is often associated with the peculiar prevalence of various moulds and mildews—a source of terror and superstitious horror in bygone time, which gave rise to the idea of a raining of blood. Plutarch refers to such an occurrence in the plague of Rome. Hecker, in his work on the Epidems of the Middle Ages, also associates it with the disasters of 789 and 959. The spots were actually observed on garments, and called lepra vestium; *signacula* was another term. In 1502 and 1503, it again frightened everybody. Agricola was certainly one of the first to give a rational explanation, he attributing it to the appearance of a lichen. The fungi attacked walls, bread, cheese, meat even, and garments, in Venetia, in 1819, and also articles of food, and garments, and all fruits, during the years following to 1829. And is there not something similar observable now-a-days? Have we not had some very remarkable and severe epidemics, and have not fungi been remarkably abundant on vegetation? I will not theorise, but merely just draw attention to the coincidence. The particular action of fungi now under notice will perhaps be better appreciated in connection with that now to be described.

Fourthly, which looks upon these organisms as developers of poison, and comprehends Dr. Richardson's forsaken theory of zymosis—a doctrine that appears to me most satisfactory. It has been suggested at different times by one and another observer, that the fungi themselves induce change *actually in the circulating current*, sufficient to account for

disease, either by setting up a kind of fermentative action in the blood, giving rise to the production of a specific compound—a poison, in fact, just in like way to that which happens in ordinary fermentation, or setting up change by catalysis—a wonderful enigma. Others affirm that no poison is produced in the body itself, but that the fungus helps out its increase when once introduced into the system. For my own part, I can not believe that any very important change could be induced by the growth of fungi in the blood-current. The presence of air is so very necessary; and not only mere presence, but such as is implied by a direct communication between the growing vegetation and the external air. Outside the body, or in the cavities which communicate with the air, many very important and frequent changes are induced without a doubt.

Dr. Salisbury is a careful observer. He declares, and as far as I know holds to his opinion, that a form of disease, if not identical, at any rate very like measles, results *under certain circumstances* from the inoculation of the fungus of wheat straw. Dr. Kennedy has given confirmatory evidence. Does the fungus, *per se*, produce the result, or is it a conveyer, or is it the producer of the poison outside the body in the musty straw?

Dr. Richardson, quoted by the late Dr. Barker, of Bedford, records the onset of erysipelatous mischief from a like cause. In France the most serious inflammatory mischiefs of veins and lymphatics have followed wounds inflicted with instruments used to cut off the diseased vine-shoots. Dr. Collin, the medical inspector of the waters of the St. Honoré, Nievre, records even fatal results. MM. Demartes and Bouché of Vitrany have also investigated this subject, and conclude that the oidium *can* produce such mischief, but they suggest some sort of coincidence between the special development of

the oidium and the occurrence in greater frequency of inflammatory disease. It is to be hoped that the French Academy will, now it has taken note of the subject, enter into a full investigation of it. It is true that ill effect does not always follow experiments with the oidium. MM. Speneux and Letellier failed to produce anything beyond a little redness and irritation by inoculating people with the rasping of leaves diseased by the oidium (Pract. Jour. of Med. and Surgery, Nov., 1864); and MM. Leplat and Taillard on the one, and M. Wertheim on the other hand, came to opposite results by injecting fungus elements into veins of dogs and other animals. There can be no questioning that some fungi are more hurtful than others, and much depends upon the concomitant conditions. The arunda donax, the large red reed of the south of Europe, is attacked by a black rust, and those who cut the reeds suffer from very violent headaches; it is affirmed by M. Michel that the spores produce a papular rash on the face, with much swelling, and a good many serious general symptoms (Yearbook, 1861-2). It would seem that the fungus, *per se*, is not sufficient, but that there is something in addition which is intimately connected with the vitality of fungus. This would seem to be taught by the case of bacteridia. Whatever they be, no injurious results happen unless the medium itself in which they exist contain some peculiar virulence of its own, just as in the case of inflammatory attacks caused by oidial inoculation. The power of vegetable organisms to induce transformation, which must of course be accompanied by distinct chemical change, has been well exemplified by an experiment of M. Lemaire, who took some beans, placed them on a moist sponge, and found that bacteridia soon sprang up, before germination, being succeeded by monads and vibriones; and the like happened after the soil used had been heated to

a red heat. Now, if a small quantity of phenic acid (which has the property of suspending infusorial development) was added, the germination came to a standstill until the phenic acid evaporated, when it recommenced. M. Pasteur's experiments on acetic fermentation tend to the like result; and M. Trècul's observations lead to the belief, that the change induced in solutions by fungi, as in the case of alcoholic fermentation, depends upon the performance of the nutritive act of the vegetable cell. The fact is, the fungus, when growing, necessarily decomposes the medium, and induces chemical change, whilst the result depends upon the composition of the material acted upon. In like manner, it is conceivable that the fungus of wheat straw acts upon the juices of the stem, producing some subtile compound; bacteridia do the same in *sang de rate*, and the oidium in the vine disease.

It has been supposed that the poisons of measles, influenza, cholera, nay, asthma, and some other acute diseases, may be produced in the way indicated; but it must be remembered that two or more of the modes of action already noticed may be conjoined, that is to say, a fungus may act mechanically as a conveyer and developer of poison at the same time, and in one case. But not only acute but chronic diseases are produced. I refer to the large class of instances in which vegetable parasites induce slow changes of deleterious nature in articles of diet, giving rise to "ergotism." Bad grain, bad potatoes, bad rice, bad maize, are illustrative. The late Russian epidemic, the Irish fevers, pellagra in Lombardy, gangrene in sheep and beasts, ergotism in horses, have all been regarded as taking origin especially from the play of ergotized foods. In the group of *chronic* maladies the material acted upon by the fungus is a solid. The access of air is not so perfect nor so free; the moisture is considerably less; all of which tends, in great measure, to

+ Carbolic acid

account for the difference of the quality of the resultant morbid product. The productiveness of grain so infested is considerably lowered. Sir H. Davy proved this long ago. He found that diseased wheat yielded from 21 to 65 per cent. of nutritious matter against the 95 per cent. of the healthy grain. It has been suggested at various times that the degeneration of rice by parasitic action gives rise to the formation of products which occasion very severe symptoms of intestinal irritation, resembling dysentery, and that œdema of the leg often follows. And it is not unlikely, that the many peculiar ulcerative conditions of the lower extremities are favored by the quality of food and induced in like manner. The diminution in the productiveness of the silkworm affected by muscardine affords a capital instance of analogical occurrence. The statistics issued by the Chamber of Commerce of Turin show that although formerly about some 650,000 myriagrammes of cocoons were produced in the country, in 1864 there were 525,000, and last year 283,000 only. I have been paying some little attention to the case of mildewed cotton—hunting after *illustrative* facts—and I find that the germs of mildew are really present in the cotton in its rough state, as sold in the market before it reaches the manufacturer. It of course is possible that the processes through which it passes in the hands of the latter may destroy all the vitality of the fungi, but this is not certain; but if it really does, still the fact of the presence of mildewed germs in vigor would imply the existence of a certain degree of deterioration in the actual fibre itself, perhaps induced by the bad cultivation or growing of the original plant—a point of no mean interest to the merchant. It would make the fibre less able to resist the action of the size and other agents used in the manufacture into stuffs.

I have spoken of things going on outside the body, and

then introduced to it; but within a recent time, certain facts have come to hand showing that under special conditions, though good food be taken into the stomach, yet, in the digestive tract, changes of objectionable character may be induced by the agency of fungi. I have to quote Dr. Salisbury again as my authority. He believes that chronic diarrhœa in the army is caused in this way (see the report of the surgeon-general of Ohio, in the *Amer. Jour. of Med. Sciences*, 1865). Wherever there is a poor amylaceous diet, and there be retention of the food, the torula, almost always present, grows, and in so doing induces fermentative changes, with the evolution of gas—the production of intestinal irritation and diarrhœa—the torula vegetating into a myceliated "algoid" mass, which may be observed in the fæces; and it appears that its amount is in direct relation to the severity of the disease; the production of sugar being rapid and detectable in the mucous tissues. The green stools of children are so produced, and Dr. Salisbury thinks also that semi-paralytic symptoms ensue. The case of sarcinal disease is on a par entirely; deranged digestion, detention of food, the presence of penicillium, and the evolution of gas with the formation of sarcinæ; vomiting is the result of gastric, as diarrhœa that of intestinal irritation. The stomach in the former, and the intestines in the latter, getting semi-paralysed, at least losing tone and getting relaxed. In both cases there is the mechanical action of the fungus and the induction of chemical changes within the body. The case of diseased foods is one of surpassing consequence, and deserves all the attention we can afford to it.

The quality and character of the poisons or products of this fermentative act are matters of no little interest. Dr. Richardson has lately deserted the zymotic, and given his adhesion to a new theory, which regards the poisons as of an alkaloid character—basing this position upon the

supposed isolation of the pyæmic poison; however, further experiment is needed to establish the truth of the new doctrine. If the poison of so-called zymotic diseases be chemically inorganic, how comes it that nothing of the kind can be obtained by chemical analysis? The diffusion and spread of disease is opposed also to such a view. There is a power of increment about these viruses which is very marvellous and peculiar. There is also a vital principle or act which is very distinct. Another feature worth notice is this, that the effect of the poison does not seem to be, as is the case with mere chemical agents, proportionate to the dose, so to speak, but to the peculiar virulency, which varies as much as the state of the nutrition of the organism acted upon. The viruses certainly, as to their characters, vary considerably, and are not *definite* in the way that we would expect if they were of an alkaloid nature. Independently even of these kinds of influence already noticed, fungi, in the fifth place, would seem to possess inherent noxious qualities in some cases. Just as insects have the power of producing special poisons, so may fungi in a much less degree. The anamita muscaria affords a resinous principle, which chemists isolate. In other cases—for example, the mushroom—there is evidently an alkaloid, as MM. Sicard and Schoras have shown (*Journal de Pharmacie*, 1865); but the action of it is different from that of viruses altogether.

Now I have mentioned five different ways in which fungi may act; and these may be summed up as follows, being divided into those which are direct and indirect: Directly, they may act mechanically, or by inducing local chemical change; indirectly, by bringing about changes in substances out of the body, which are brought to influence the latter; by setting up a kind of fermentative action in part due to the oxidation consequent upon the nutritive changes in the plant, or by giving rise to

products having an acute or a chronic action, and whose nature is at present a matter of doubt.

And now I am prepared to meet the hypothesis that parasitic disease has nothing essential to do with the development of parasites. Mr. Hunt takes the boldest view in the ranks of the opposition, declaring that the causes of parasitic disease are four, and four only—uncleanliness, atmospheric impurities, deficient exercise, and contagion. I take my stand upon the mechanical action of fungi and the induction of fatty changes, and defy any one to shake me the least from my footing. Mr. Hunt states that the above four conditions "poison the blood, producing not only their immediate effects in the form of parasitic skin diseases, but laying the foundation probably of more serious disorders, manifested in after life by the presence of lumbrici, ascarides, tape-worm, pediculi, fungi, hydatids, tubercles, and perhaps cancerous germs, in the various organisms." What does this mean? That these varied mischiefs have not each their proper cause, but arise from one and the same influence. This is surely either subversion of the logical definition of cause—unconditional sequence—which is so tenaciously upheld and received as our only true belief. I grant that the four states lower the nutrition of the system, and make it more fit for parasitic growth; this is only one item of the total. The true state of the case I take to be this: That there is a necessary nidus, which is exalted by some into the position of the supreme disease, to the negation of any and every effect produced by the fungus itself, which finds the soil congenial—a soil associated with bad living and bad hygiene of all kinds; the fungus growing acts in the various ways already detailed; in ordinary cutaneous affections, the effect upon the hair and epithelium (mechanical and chemical) being *pathognomonic.* Parasitic disease, then, is a composite affair, consisting of mal-

nutrition, a growing parasite, and certain effects of such growth.

There is yet one category of facts that needs a word or two of comment, viz.: the comparative pathology or the intertransmission of parasitic (vegetable) maladies. In addition to what I have given in my work, a good deal of information has been accumulating. It is now admitted that the transmission of the common ringworm of the surface from animals to man is very common. I am informed upon good authority that this is of very frequent occurrence in Australia, the milkers of cows especially being largely affected. Professor Gerlach (abstract in Ed. Vet. Rev., vol. ii.) has noticed it in dogs, horses, and oxen, and in man, but the sheep and pig seem to offer exception. Dr. Frazer (*Dub. Quart. Jour. of Med. Science*, May, 1865) contributed a paper, "Remarks on a Common Herpetic Epizootic Affection, and on its alleged frequent Transmission to the Human Subject," containing cases. This gentleman quotes Mr. Brady and Mr. Whitla, in reference to other instances. Dr. Fehr has noticed in Switzerland the transmission from cattle to man. I can confirm by my own experience the truth of these statements. I do not mention any old cases, such as mice affecting man, but my friend, Dr. Allchin, informs me that he has seen the transmission of mange from a cat to a child.

Now, I might argue just in like manner in regard to the animal parasites. The two classes of cases are mutually illustrative of each other's *modus operandi.* I take the case of scabies. The acarus demands a suitable soil. It has been pretty well shown, in animals especially, that acari will not grow on all surfaces, but only on those whose hygienic condition we have reason to know, from the circumstances that have been at play, is not that of health. The limit of variation is by no means made out

in the case of the animal parasites. The relations of acari on bodies generally is being canvassed, especially by German writers. The mode of entry has an analogy also. There is the same difference of opinion as to whether the acari are accidentals or *veræ causæ;* but there is plenty of evidence to indicate the iraction as mechanical irritants, and as the possible developers of irritant products. But these points I can not now enter upon.

The matter of the action of fungi is a large and wide one; already we see enough to show that the studious inquirer will be amply repaid if he tread carefully the somewhat now uncertain path before him, and the promising indications of success are many.—*Edinburgh Med. Journal, April*, 1866, *p.* 875.

On Fevers. By Dr. H. BENCE JONES, F.R.S.

[Perhaps the term zymotic disease is as good as any to designate the action of those poisons which get into the system in such a mysterious way that we can not explain them. The term implies some action by which different vegetable or animal ferments, living or dead, can be introduced into the body and produce different diseases, such as small-pox, scarlet fever, measles, typhus fever, etc.]

Of all the modified peroxidations that can occur in the body, small-pox is the most definite, because the poison can be got apart, and the quantity necessary for producing the action can be fixed, and through the most glorious discovery of vaccination it can be set in action whenever we please. We can almost see it passing from the cellular tissue into the blood, and from the blood into every particle of every texture, rendering it incapable of undergoing the same action again.

Let us look a little closer at this action of small-pox poison. If the minutest particle of substance, a little

dried albuminoid substance, in a peculiar chemical state of action, on a lancet, or in the dust of the air, is put into the cellular tissue or is inhaled into the lungs, it passes on to the blood, and through it into every texture. In a few days the chemical actions of oxidation and nutrition throughout the body are altered, and the particle of matter has reproduced itself immeasurably. The violently increased chemical action, the peroxidation, is shown by the increased heat of the body, the violent fever. The altered nutrition is evident, not only in the eruption of pustules in the cellular tissue under the skin, but in the altered condition of the blood and in all the textures of the body; each particle of substance being rendered incapable of undergoing the same process again, and by assimilation every future particle that takes the place of every modified particle is also generally incapable of being modified again.

Throughout the course of the general peroxidation, and more especially at the end of the fermentation, local peroxidations frequently come on in any part of the body. Inflammations of the eyes, the ears, the mucous membranes, the joints, the serous membranes, the parenchymatous tissues, anywhere an unmodified peroxidation is ready to begin, and this easily gives rise to suppuration or causes obstructions which the feeble circulation can not overcome.

The most striking facts concerning this small-pox ferment are, first, the very small quantity of substance that produces so much effect; secondly, the immeasurable increase of the poison in the body, each pustule having the same property as the original ferment; thirdly, the period of incubation during which the poison must at first slowly increase in every texture, and there give rise to the modified peroxidation and altered nutrition which constitute the attack.

The poison of scarlet fever, of measles, and of typhus, though less tangible, are not less substantial than the small-pox ferment. Like it, they can most probably be dried and carried from place to place, and pass into the mouth with the dust which we each moment inhale or swallow. In chemical composition, scarlet fever, measles, and typhus ferments most probably resemble albumen in complexity, and, like albumen, they may be altered in composition and action by heat, alcohol, arsenic, tar acids, and many metallic salts. As soon as they reach any spot where they can oxidise, they set up an oxidation and reproduction in each contiguous particle of albuminous substance. From the cellular tissue, the air passages, or the stomach or bowels, the contact action spreads into the blood, and there it multiplies, whilst it is carried into all the capillaries, and through them into every texture of the body; then the increased oxidation and formation of ferment becomes most violent, and fever to a greater or less degree is present. Long after the strongest action is reached, a slower action continues, and at any time or in any part or texture of the body, whilst the specific chemistry is going on, an ordinary local peroxidation may be lit up, and a more or less acute inflammation may be added to or follow the fever which the ferment has produced.

During the height of the fermentation in typhus fever, the heat may rise to 5, 6, or even 10° Fah. above the ordinary temperature; and when the fermentation is ended, the albuminous textures of the body are so changed that they are incapable of going through the same process again. Between these two results there are innumerable other products of chemical change, varying with the kind and degree of fermentation. In typhus fever it is said that urea is increased and carbonic acid diminished. To these and a multitude of other chemical

questions regarding fermentation chemistry will give definite answers; but above all questions, one of the most difficult to answer and yet one of the most important, is the amount of oxygen that is consumed in the different kinds and degrees of peroxidation which can take place within us.

In each organ, according to the intensity of the action set up by the ferment, altered functions may arise, and these may be still more altered when an ordinary peroxidation at the same time takes place. Thus the brain, heart, lungs, kidneys, liver, or any texture composing these organs may show by more or less wrong mechanical results the effect of the ordinary or modified peroxidation; and the effects of the fever and of the inflammation may be so mixed that neither during life nor after death may any accurate separation be possible.

Closely related in chemical composition to these violent ferments are the less active ferments of ague and typhoid fever. There is so little difference in the chemical composition of animal and vegetable substances that the distinction between animal and vegetable poisons is no longer possible. Vegetable albuminous matter undergoing change may produce almost, if not quite, exactly the same poison as animal albuminous matter. Hence, probably, the resemblance between ague poison and the typhoid fever poison, and the possibility that sometimes one and sometimes the other of these poisons may be formed from the same changing matter under different circumstances.

Ague ferment is probably a highly complex nitrogenous substance, capable of being dried and carried by the wind far from the place where it was produced. It enters by the mouth with the dust, and, like animal or vegetable alkaloids, it passes from the blood into every texture of the body, and acts on each much or little, according to

its chemical properties. Probably it acts most strongly on the nerves that regulate oxidation, causing for a time contraction of the arterial vessels, and consequent sub-oxidation everywhere. The increased obstruction of the small arteries reacts on the tension of the blood, and this produces increased contraction of the heart, which continues to increase until the obstruction yields and a state of peroxidation is set up, by which the poison is partially destroyed. During the remission, probably, the poison is reproduced until sufficient, in from one day to three days, is formed to go through the same action again.

This theory of ague admits of a reasonable explanation of the action of quinine and arsenic in stopping the paroxysms of the complaint. On the ague poison itself quinine and arsenic may have no action, but they pass into every texture from the blood, and, combining with the nervous substance on which the ague poison acts, they form a compound on which the ague poison is incapable of producing an effect before it is oxidised and destroyed.

The ague poison, unlike the small-pox or typhus fever ferment, instead of protecting the body by making it incapable of undergoing the same action again, makes the nerves more ready on the slightest renewal of the poison to undergo the same action again; so that it has been said that the ague poison may lie dormant for years. It is far more probable that a much smaller quantity of the poison can produce the return of the symptoms than that the original ferment should retain its properties for months, or even for years, after its first action had passed by. In this respect, and in some others, the action of ague poison proves that it is a very peculiar ferment, and hence, though I have placed it near to the typhoid ferment because of its origin, I must shortly point out to

you the different effect which the true typhoid ferment produces.

The typhoid ferment is probably formed out of vegetable or animal albuminous substance. In sewers, in drains, in ditches, possibly even in the drains of the human body, a substance may be formed which is not volatile in itself, but by foul gases or currents of air can be carried into the mouth, and in some period between a few hours and fourteen days it sets up a modified peroxidation. More slowly absorbed and less rapidly reproduced and changed than typhus ferment, it passes into the blood, and from it into each texture; whilst some of the poison has a local action on the glands of the small intestine, and produces increased action, effusion, obstruction, and retrograde action, causing ulceration, sloughing, and even perforation, by which mechanically the contents of the bowel may escape, and an uncontrollable simple peroxidation may be set up. The poison that has passed into the tissues acts on each organ more slowly than the typhus poison; still, like it everywhere, it gives rise to altered functions, and everywhere local peroxidations are ready to occur; bronchitis, pneumonia, peritonitis, tubular nephritis, cystitis—any of these and many other inflammations may be set up at any time during the course of the fever. Probably the substances produced by the increased chemical action in typhus and typhoid fever will be found to be very similar. There may be the same amount of heat, the same excess of urea, the same excess of antecedent substances from which the urea is formed; possibly the same consumption of oxygen when the same temperature in each fever occurs; but in the properties of the ferment formed in the body a distinct difference of diffusibility must exist, the typhus poison passing with greater ease into neighboring bodies; whilst the typhoid poison rarely, if ever, is communicated by infection.

On the Mechanical Disorders that arise out of the Chemical Errors in Fevers.—In all fevers the loss of mechanical power is quite as remarkable as the increase of chemical action. The chief amount of energy liberated by the action of oxygen in the body seems expended in the production of heat, so that far less than the ordinary amount of power remains to be employed in the production of mechanical motion. The muscles may be considered as machines made for the conversion of chemical force into mechanical motion. How this is done can not be explained in the present state of our knowledge of the mechanical, chemical, or electrical actions in the muscle; but that the muscular force arises from some equivalent force, and sooner or later must come from the chemical force in oxygen, hydrogen, and carbon, opens an immense field for investigation, and is easier of belief than that force should be each moment created and destroyed. The amount of sugar and fat present in any muscle would soon be used up if in the working of the muscle itself fresh fuel was not produced. The action of oxygen on the syntonin in the muscle may be direct, and may give rise to the force required; but it is more probable that the syntonin splits into substances of two classes—one ending in urea, which is incapable almost of combustion, the other in inosit, which would immediately give water and carbonic acid.

In fever the poisonous ferment in the muscle probably determines a different chemical action from that which takes place in the muscle in health. The increased heat and the increased urea mark the increased action, but loss of motor-power in the muscles shows that the conversion of chemical into mechanical force does not take place.

This mechanical disorder becomes, by its action on the muscles of respiration or circulation, the source of com-

plications and dangers in fever, to which I must shortly allude. Gradually in the course of fevers the sounds of the heart may be found to become more and more feeble, and the respiration, without any wrong in the lung, becomes shallow and weak from the diminished power in the muscular tissue. The diminished tension in the arteries has a direct effect upon the circulation through the capillaries, and the motion in the veins is more or less stopped; hence congestion of blood in the venous system occurs—hemorrhages, effusions, and coagulations in the veins may take place anywhere. The imperfect action of the muscles of respiration produces the same mechanical effects in the circulation through the lungs; imperfect oxygenation takes place in the lungs from the stoppage of blood in the pulmonary veins; without any inflammation, œdema of the lungs, hypostatic consolidation may occur. The circulation through the lung is so feeble that even the force of gravity acting on the blood in the lungs can not be counteracted, and accumulation takes place in the most dependent parts.

The muscles of the bladder are also so weakened that the urine accumulates, and frequently external muscular pressure is required, after the catheter has been passed, to cause the urine to flow.

In another large class of zymotic diseases the qualitative and quantitative errors of oxidation are scarcely detectable, whilst the qualitative and quantitative errors of nutrition chiefly mark the action of the poison.

Of these diseases true syphilis may be taken as the type.

It can scarcely now be doubted that the actions of two poisons have been included under the term syphilis. The first, like impetigo, is capable of being communicated, and often repeated, because it exists only locally, or passes up to the nearest lymphatic glands; whilst in the true

syphilis the poison from the local sore enters the blood and passes from it into each texture, where it multiplies and produces changes of nutrition, and, partly unchanged and partly changed in composition, passes out perhaps in each secretion.

This true syphilitic ferment resembles very closely the small-pox ferment in the universal diffusion of the poison, and in the consequent protection it gives from another attack by rendering a second similar change in each texture impossible. The protective power of the alteration is to a slighter degree extended to the progeny through the germ and spermatozoon; so that a race partly protected by inheritance may suffer less from these diseases than a purer race, whose textures are free to undergo the full change which constitutes the disease. Both poisons give rise to increased cell-growths, effusions, oxidations, congestions, and ulcerations; and these may take place in any part of the body, for the poison exists everywhere.

True syphilis differs, however, altogether from small-pox in its definiteness of course as to time. Syphilis produces no fever to terminate the fermentation in a definite period, and it may consequently remain active or dormant in the textures for years.

It is vain now to ask what circumstances at the end of the fifteenth century produced the first modified albuminoid matter which gave rise to the first true syphilitic poison. In cancer, which bears a distant resemblance to syphilis, although the spontaneous generation of the first cancer-cell is daily occurring in some predisposed texture, yet we are as yet quite unable to say what produces the first modified particle of matter which multiplies and communicates its composition to adjacent predisposed textures by contact, and is carried by lymphatics and blood-vessels to every part of the body, and affects the nutrition of each part with which it comes in contact,

provided the textures are in a condition to propagate the cancer-cells.

Another instance of spontaneous generation of a poisonous ferment is presented to us in rabies; and with this poison also, unless a peculiar condition of system exists, the ferment when inserted has no action; and here also our knowledge is at present unable to say what circumstances determine the formation of the first particle of poisonous saliva; except by its effects, the peculiar change in the albuminoid matter of the saliva in the present state of chemical knowledge could not be recognized.—*Med. Times and Gazette, March* 17, 1866, *p.* 275.

CONSERVATIVE MEDICINE.

Among the improvements in medicine which characterize our epoch, none is more gratifying than the gradual abandonment of excessive medication, and especially of deteriorating agents, and the increasing reliance upon the resources of the economy supported by improvers of the stamina. Under the influence of the phlogistic and antiphlogistic doctrines which have so long swayed the profession, nearly all diseases were regarded as more or less indicative of exalted or excessive action and increased vitality, requiring at the hands of the physician the use of such means as might seem best adapted to the reduction of the morbid orgasm, and to the impairment of the vital forces supposed to be in excess. Hence the very general resort to the abstraction of blood and to depletion by means of emetics, cathartics, abstinence from food, and the disintegrating influence of mercurialization. The sole object of the medical adviser seemed to be to impair the energies of the system. While he was dealing her-

culean blows at the disease, he seemed to forget that he was doing so at the expense of an organism already contending with an enemy which was sapping the very foundations of its existence. And yet results show that all who were thus treated did not die; for while with some the thread of life is snapped by the most trivial causes, it is in others so strong as to resist the most extraordinary combinations of violence.

But the Broussaisian ultraism wrought its own cure; and Andral, Chomel, Louis, and others of the Parisian school, boldly took their stand in the breach, and successfully inaugurated the researches and observations which are now culminating in conservative medicine. Hahneman, disgusted with destructivism, but not possessing genius enough to suggest anything else, resorted to the miserable subterfuge unfolded in his "Organon," instead of manfully acknowledging that he preferred no treatment to that then in vogue. The French had already ascertained that many affections were more successfully treated by "expectation," but this did not lead them to the abandonment of professional interference where this could be manifestly advantageous. The era of observation had commenced, and we are now reaping the benefits of a more thorough acquaintance with disease as well as with physiology and therapeutics. We now look upon morbid action as an impairment instead of an exaggeration of vitality, which may be arrested by antidotes when the cause is appreciable, and by sustainers or improvers of the energies of the system in other cases. We are now satisfied, in managing cases for which we know no specific, to strive to enable the patient to live through the disease, instead of striking in the dark at the expense of the vital energies.

Our malarial fevers, so called, furnish us with one of the most striking illustrations of the improvement to

which we refer. In these the antidotal has superceded the empirical and the antiphlogistic treatment. It matters little whether we regard quinine as a neutraliser of the poison which induces these fevers, or as acting in any other way. No one questions its specific effect, through the instrumentality of which we have acquired the mastery over this class of affections, and thus learnt at least that antiphlogistics are not necessary to subdue the intense excitement (I use this term for want of a better) so often apparently attending these affections, and that it may be abated simply by fortifying the system against the poison which induced it.

Again, look at the history of the treatment of typhoid fever, and see what variety of means have been invoked to subdue the fever and the local ulceration so generally accompanying it. All the deteriorating agencies have been tried in vain; expectation was somewhat more successful; but when we compare these results with those recorded by Chambers under the conservative plan of treatment so ably set forth in his Clinical Lectures, we have every reason for congratulation.

"Since the opening of the hospital in the summer of 1851, to the time of my leaving London for the vacation last August (1863), there have been registered as under my care 230 examples of continued fever. Of these, 109 have been treated on what may be termed "general principles;" that is to say, they took neutral salines three or four times a day, with small doses once or twice a day of hydrargyrum cum cretà at first, and later in the disease bark, ammonia, ether, and wine, when these remedies seemed required by the symptoms. Leeches and cupping were employed to the exterior of inflamed viscera as occasion called, and food was administered at the ordinary four daily meal-times. The other 121 have been treated on an uniform plan of continuous nutrition; animal food, in a liquid form, has been given every two hours, day and night, while the patients were awake, and between every dose of nutriment a dose of hydrochloric acid. They have been sponged two or three times daily with tepid water, when the skin was hot and dry; and, in a few instances, leeches or cupping have been used to the exterior of inflamed localities in the abdomen or chest.

Of the first series (viz., those treated on general principles),

9	are entered as Typhus, and of these there died	4
44	are entered as Typhoïd, and of these there died	16
56	are entered as of doubtful or unrecorded type	3
Total 109		Total 23

Of the second series,

25	are entered as Typhus, and of these there died	0
52	are entered as Typhoïd, and of these there died	2
44	are entered as of doubtful or unrecorded type	2
Total 121		4

For purposes of comparison in a therapeutical inquiry, it will probably be considered right to exclude from the first table two deaths, and from the second table one death, which occurred within two days of admission: for the exhaustion caused by the journey to the hospital in severe fevers allows but little scope for judging of the action of treatment during that period. This leaves the average mortality under general treatment 21 in 107=19½ per cent., or nearly 1 in 5 ;* under the second method of treatment, by continuous nutriment and hydrochloric acid, 3 in 121=2½ per cent., or only 1 in 40.

The continuous liquid nutriment given every two hours consisted of strong beef-tea and milk, of which together about six pints were administered in the twenty-four hours. The hydrochloric acid was given every two hours in doses of twenty minims of the Pharmacopœal dilute acid in water or eau sucrée. Both food and drugs were seen by the nurses to be swallowed, and not left to the discretion of patients, who from nausea and occasional delirium can not be trusted to help themselves."—*Chambers' Lectures on the Renewal of Life, pp.* 118-120.

One of the first and most important steps in conservative practice was taken in the management of persons affected with phthisis pulmonalis. Who does not recollect the repeated blood-lettings for the arrest of hemoptysis, the low diet for the reduction of febrile action, the antimonials to promote expectoration, the blisters to excite revulsive action, and the confinement in a heated apartment to obviate the baneful influence of cold in winter?

* This mortality is higher than is usual at special fever hospitals, being about the same as at the other general hospitals in London.

All this was done under the impression that action or vitality was in excess, and should be lessened. But now that we look upon phthisis as characterized by defective stamina or impaired nutrition, how different the treatment. We do all in our power to improve, to strengthen, and to brace up the powers of the system in order that they may combat the tendency to death. We promote digestion by every possible means, administer nutritious oils, and order free exercise in the open air, and thus save many who would have otherwise perished.

Since then many other diseases have been successively subjected to the test of conservative medication, and always with most beneficial results. May we not hope that the profession will calmly review the grounds of their old faith in deteriorating medication, and ascertain whether they may not be more successful by the adoption of a more conservative practice? They will find much valuable aid in so doing by perusing the lectures of Dr. Chambers, already cited.

L. A. D.

OUR MOTTO.

It will be perceived that we have replaced the old motto of this Journal upon its title-page, in lieu of the one adopted by our predecessor in the first number of this volume. This is done in no captious spirit; but simply because we prefer that under which this Journal has earned its reputation for practical and impartial literature. It is concise, to the point, and a correct exponent of the principles by which we intend to be governed in filling these pages. *We shall adopt what is good wherever we find it.*

Pereira's Materia Medica and Therapeutics; being an abridgment of the late Dr. Pereira's Elements of Materia Medica, arranged in conformity with the British Pharmacopœia, and adapted to the use of Medical Practitioners, Chemists and Druggists, Medical and Pharmaceutical Students. By F. J. FARRE, M.D., Senior Physician to St. Bartholomew's Hospital, and London Editor of the British Pharmacopœia; assisted by Robert Bentley, M.R.C.S., Professor of Materia Medica and Botany to the Pharmaceutical Society of Great Britain; and by Robert Warington, F.R.S., Chemical Operator to the Society of Apothecaries. With numerous additions and references to the U. S. Pharmacopœia, by Horatio C. Wood, M.D., Professor of Botany in the University of Pennsylvania. Illustrated with wood engravings. First edition. Philadelphia: Henry C. Lea, 1866. 8vo., pp. 1,030.

This book supplies a deficiency long and seriously felt. The parent work of which it is an abridgment is a standard one both in this country and in Europe, and yet its elaborate, recondite character has made it more or less unsuited to strictly practical readers; in other words, it is better adapted to the purposes of men of research than the medical student and practitioner. This objection no longer exists: it has been abridged, condensed, simplified —in short, converted into a manual of easy reference for those who need it most.

The English authors state that they have retained the original classification, but have excluded all remedial agents, except those termed "pharmacological," and, of the latter, such as are not contained in the British Pharmacopœia. To this selected material, the American editor has contributed numerous references to the U. S. Pharmacopœia, thus adapting it to our home readers also. While, perhaps, it cannot be expected to supercede the admirable American works upon materia medica and therapeutics of recent publication, it will, nevertheless,

become a welcome addition to every physician's library and a valuable text-book for students. To such as need additional books for consultation on this branch of medicine, we would respectfully commend it. W. H. D.

The Science and Practice of Medicine. By WM. AITKEN, M.D., Ed. Professor of Pathology in the Army Medical School, etc., etc.; in 2 vols. From the 4th London edition, with additions by Meredith Clymer, M.D., late Professor of the Institutes and Practice of Medicine in the University of New York. Philadelphia: Lindsay & Blakiston, 1866. Vol. 1; 8vo., pp. 955.

This is one of the most extensive works upon the practice of medicine in our language, and comes to us with the prestige acquired by the rapid sale of four editions in England. We have as yet received only the first volume of the American edition, but learn that the second is nearly ready. Intended for the use of the Medical officers of the British army, the influence of climate upon disease has been kept in view, and the author has largely availed himself of the practical contributions of the medical staff of the British army and navy, and of the resident physicians of the East Indies. The Department of Medical Geography received attention for the first time in a treatise on the practice of medicine. The practical importance of the thermometry of disease is set forth, and diagrams illustrative of the typical ranges of temperature, particularly in febrile diseases, are given for the first time in a work of this scope.

The additions by Dr. Clymer will add considerably to its favor in this country; but the American editor has not done himself justice in having omitted much that he might have added in relation to *our* diseases and *our* mode of treating them.

A Practical Treatise on the Physical Exploration of the Chest and the Diagnosis of Diseases Affecting the Respiratory Organs. By AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine in the Bellevue Hospital College, etc. Second edition, revised. Philadelphia: Henry C. Lea, 1866. 8vo., pp. 590.

This invaluable book has reached its second edition, and, contrary to the prevailing custom of authors, it is reduced in size—not from the want of materials, but because the author, appreciating its *practical worth*, sought to increase it by divesting the subject of "complexity and needless refinements."

We would not hesitate to commend it in even *extravagant* terms, if by so doing we could arrest the attention of those who need it most. If possible, we would place it in the hands of every student, preceptor, and professor, with the assurance that, under its careful study, more knowledge of the subjects discussed would be obtained than from any other publication extant. Ordinarily, physical exploration by the various methods now practiced is an exaggerated "bug-bear," and exactness in its results is considered so difficult as to be beyond the attainment of ordinary persons. We venture to assert that this delusion will be quickly dispelled, if any thoughtful student will follow the order of this work; it would be better for him if he had never heard of, or experienced confusion of mind from, the old, arbitrary terms applied to respiratory sounds, as "*rude*" respiration, a "*short, whiffing*" sound, ending abruptly in a "*click*," etc.; for, adopting the nomenclature of the author, he would have a simplified form, the types of the different sounds (except the adventitious) being found in the normal respiration. He is led first to examine the sounds of the healthy chest in its various topographical regions in percussion and auscultation. The normal vesicular resonance, and the laryngeal, tracheal, bronchial, and vesicular respiration are taken as types of sounds in their intensity, pitch,

and quality, with which are to be compared the variations or modifications produced by disease. When, therefore, in the second stage of pneumonia, the inquirer meets, perhaps for the first time, the "tubal" respiration (of old writers), he instinctively applies the word *bronchial*, because it is similar to the *normal bronchial* sounds, although heard over the vesicular structure; and so also with the "*rude*" respiration present in the early stage of phthisis, which is called *broncho-vesicular*, because it presents modifications of the normal vesicular and bronchial respiration combined. The nomenclature is descriptive, and conveys in itself the distinctive characters of the most important signs. The author devotes little attention to their mechanism, but labors to establish and define their pathological significance by means of extensive "clinical facts in connection with morbid anatomy."

The chapter upon the "Correlation of Physical Signs" is an admirable production, convenient for consultation. Taking any single sign, you can thereby easily trace its correlative associate signs in all the methods of physical exploration, percussion, auscultation, mensuration, inspection, palpation, and succession. In the new edition this is presented in a tabular form, which, we think, is not so advantageous as the chapter in the first edition.

Physical exploration ensures the exact diagnosis of pulmonary diseases—its revelations are purely *objective*, and, therefore, more reliable, and, when properly associated with rational symptoms, they establish the diagnosis. Every physician can attain (indeed, is inexcusable if he does not) such a degree of proficiency in the art as to approach with confidence a majority of the pulmonary affections encountered in practice. For the better qualification of all, we press upon the attention of the reader this work. We have drank freely from the fountain with intense satisfaction, and are entitled to a voice in its praise.

W. H. D.

Orthopedics: A Systematic Treatise upon the Prevention and Correction of Deformities. By DAVID PRINCE, M.D. Philadelphia: Lindsay & Blakiston, 1866. 8vo., pp. 240.

The study of orthopedics has been too much neglected by the generality of medical practitioners, and many cases are therefore left without treatment, or are unsuccessfully managed. All endeavors to facilitate the acquisition of a knowledge of the principles and mechanical appliances by which deformities are treated should be encouraged. The work before us will be found eminently practical and useful. It is an American book, and quite creditable to the author.

The Essentials of Materia Medica and Therapeutics. By ALFRED BARING GARROD, M.D., F.R.S. Second edition, 1865. New York: William Wood & Co.

As its name imports, this is a concise, comprehensive digest of medicines; their nature and value in the treatment of disease. Its conception was a happy one, however difficult its execution may prove. It is no easy task so to epitomize a diversified subject of this character as to retain only the essential materials; few writers possess the happy faculty of saying neither too much nor too little on a given subject. The author designed presenting the profession with a work which, while it omitted nothing essential, yet excluded "such details as are often embarrassing to the student and seldom necessary to the practitioner." In this he has succeeded admirably, although the therapeutical division of the subject is scarcely as complete as might be desired. We are informed, however, that this is to be followed by a "companion work," devoted exclusively to the therapeutical value of medicines. We have no doubt that its forerunner will meet with a favorable reception from the profession at large, and we take pleasure in directing attention to it.

W. H. D.

A Hand-book of Ophthalmic Surgery, for the use of Practitioners. By John Z. Laurence, F.R. C.S. M.B. (Univ. Lond.), Surgeon to the Ophthalmic Hospital, Southwark, etc., etc.; and Robert C. Moon, House Surgeon to the Ophthalmic Hospital, Southwark. With numerous illustrations. Philadelphia: Henry C. Lea, 1866. 8vo., pp. 190.

This little work, gotten up in Mr. Lea's best style, is a most excellent manual of ophthalmology. It contains all the modern improvements in diagnosis and treatment, and condenses in a small space what is too often made to fill a ponderous volume. The illustrations are graphic, and will aid the student very much in understanding the use of several modern instruments for examining the eye.

D.

Practical Therapeutics considered chiefly with reference to Articles of the Materia Medica. By Edward John Waring, F.R.C.S., F.L.S., Surgeon in Her Majesty's Indian Army. Second London edition, 1866. Philadelphia: Lindsay & Blakiston.

Works upon therapeutical science multiply rapidly; it is questionable, however, whether all of them add to its perfection or material development. In this instance we confess our inability to appreciate the necessity for its appearance, possibly because we can not be classed in the author's category of "*floating practitioners*" (surgeons in the army, the navy, the East India Company's service, those engaged in "emigrant or merchant ships," and resident in "isolated spots" in distant colonies), for whom he thinks it most useful. He asks for the book no higher "distinction" than that of a meritorious compilation; but, while cheerfully according its proper value in this regard, we are constrained to subordinate it to the level of all works of a similar character when compared with the great representative works of the science. A signal degree of diligence and industry has been displayed in

completing it, and if any of our readers of cosmopolitan habits require such a volume, we think it a valuable one for their purposes. W. H. D.

A Practical Treatise on Diseases of the Skin. By J. MOORE NELIGAN, M.D., M.R.J.A., etc. Fifth American, from the second revised and enlarged Dublin edition. By M. Belcher, M.A., M.D., Dublin, etc., Fellow, Censor, Examiner, etc., King and Queen's College in Ireland, etc., etc. Philadelphia: Henry C. Lea, 1866.

Already has the distinguished author's volume gone through five editions—a favorable comment upon its value and acceptance. Skin diseases have so many resemblances that the observations of careful men can not fail to place dermatology in a favorable relation to the other branches of medicine. No class of diseases is so obscure to the mass of the profession, and the editor has made it "the chief aim throughout to make this book thoroughly fit for the practical man."

The subject has been elaborated with great care, and brought up to date. The chapters treating of "Exanthemata," the "Appendages of the Skin," and the "Therapeutics of Diseases of the Skin" will be perused with interest and profit. F.

An Introduction to Practical Chemistry, including Analysis. By JOHN E. BOWMAN, F.C.S., late Professor of Practical Chemistry in King's College, London. Edited by Charles L. Bloxam, F.C.S., Professor in King's College, London; Professor of Chemistry, etc., Woolwich. With 107 illustrations. Fourth American, from fifth revised London edition. Philadelphia: Henry C. Lea, 1866.

We recommend this volume very strongly, not only to the student of the science, but to the educated physician. It will be found particularly useful in simplifying many analyses which become necessary among critical medical observers. F.

A Manual of Auscultation and Percussion. By M. BARTH and M. HENRI ROGER. Translated from the 6th French edition. Philadelphia: Lindsay & Blakiston, 1866.

This manual is very full and complete for the use of those already familiar with the foundation—principles of auscultation and percussion. It will be found of less use for the medical student. We think that very few "who are entirely novices in auscultation" will adopt the recommendation of the preface, to "hold fast to this treatise." But for this recommendation, we should have concluded that this abstract from the large and valuable work of the distinguished authors was intended only as a manual for the expert.

To those using these methods of physical exploration intelligently, and ambitious of becoming experts in the arts, we commend it as a very full condensation of the large work to which they may not have access.

We are particularly gratified at the fair acknowledgement of the credit due to Drs. Camman and Clark, of New York, as the authors of auscultatory percussion; and surprised at the author's low estimate of what we regard its high value in determining, with exact precision, the limits of the solid organs of the thorax and abdomen, and of accidental tumors and their connections. F.

Asiatic Cholera; A Treatise on its Origin, Pathology, Treatment, and Cure. By E. WHITNEY, M.D., and A. B. WHITNEY, A.M., M.D., late Physician and Surgeon to Diseases of Women in the Northwestern Dispensary; Visiting Physician, etc. New York: M. W. Dodd, Publisher, No. 506 Broadway, 1866.

The recent prevalence of cholera in different portions of this country has invited a careful examination into its origin, development, and treatment. The volume before us contains many valuable suggestions of rational practice, and some practical ideas on "prophylaxis." F.

On Wakefulness, with Introductory Chapter on the Physiology of Sleep. By WILLIAM A. HAMMOND, M. D., Fellow of the College of Physicians of Philadelphia; Honorary Corresponding member of the British Medical Association; late Professor of Anatomy and Physiology in the University of Maryland, etc., etc. Philadelphia: J. B. Lippincott & Co., 1866.

This small volume is replete with original and philosophical views. It treats of the "physiology of sleep," the "pathology of wakefulness," the exciting causes of wakefulness," and, lastly, the treatment of wakefulness. Coming from such a valuable observer, whose physiological researches have elicited so much applause from the scientific world, it can not fail to be interesting and instructive, exposing as it does the erroneous teachings of the physiology of these states still taught by prominent authors. We cheerfully recommend it. F.

Creosote in Diphtheria.

Dr. J. J. Knott, of Griffin, Ga., recommends very highly the local use of creosote in diphtheria. His formula is as follows:

Creosote..ʒij.
Aqua font..℥ij.

Pulv. acacia q. s. to make an emulsion. To be applied to the affected surface with a sponge or mop, twice a day, until the exudations disappear.

Bleeding at the Navel.

Dr. Zober, in the *Monat f. Schr. Geburtsch*, xxvi., as quoted by the *Southern Journal of the Medical Sciences*, who distinguishes bleeding of the navel proper from bleeding due to an improper tying of the chord, or to the existence of a fungous exuberant growth, bases an opinion upon the fact that, as icterus is usually present, nutrition is partly deficient, and that the bile itself plays a part in the

destruction of the coagulability of the blood. Autopsies develop the existence of coagula in the umbilical vessels, or an aneurismatic condition of them. Martin found once an unusually large umbilical artery, with an origin from the arteria sacralis media. The blood, which flows uniformly, never in a ray, and is perfectly clear, may ooze out of a swelling or without a visible opening out of the navel. The duration of the hæmorrhage is various. Besides the symptoms of anæmia we may have concurrent with them, or at a later period, eczema, and petechiæ on the skin; or bleeding from the intestines, which may produce death just as purpura after the bleeding has ceased. Treatment in these cases is very uncertain. Compression, styptics, and the actual cautery are alike unreliable. Th. Hill once succeeded by pouring a layer of plaster of Paris over the navel. Dr. J. H. Pooley, of Yonkers, N. Y. (the *American Journal of Medical Sciences*), failed with the ligature *en masse.* He passed two stout steel pins at nearly right angles to each other through the integument and under the navel, and then applied a waxed silk figure-eight ligature, with no other result than an apparent checking of the bleeding for a couple of hours. This child was also very much jaundiced with urine highly charged with bile elements. No *post-mortem* examination allowed.—*N. Y. Med. Record.*

Treatment of Fractured Patella by the Padded Ring Method.

Dr. W. A. Gibson, of St. Louis, Mo., in a contribution to the *Medical and Surgical Journal* of that city, relates his successful treatment of a transverse fracture of the left patella, in which there was a separation of the fragments to the distance of about an inch. He measured the sound patella and had a ring made of iron (allowing for padding), which was well guarded with cotton wadding cut in strips and wrapped round the ring, over which a bandage was applied. To each side of the ring he sewed

strips of bandage. He then placed a well padded splint twenty-four inches long to the posterior aspect of the leg and thigh, which he secured by a few turns of bandage at the lower and upper ends, the bandage being loose so as not to interfere with the circulation. He kept the fragments in apposition and the ring in place by strips of bandage over the splint. At the end of thirty days, when the ring was removed, the union was *bony* and *complete.* The appliance gave no pain, and six weeks after the injury the patient was having a very good use of the limb.—*Ibid.*

Action of the Bromide of Potassium upon the Nervous System.

The actions of the bromide of potassium, according to Dr. J. Crichton Browne, in the *Am. Journal of the Medical Sciences*, are: 1. It mitigates those convulsive movements or spasmodic twitchings which are the result of the rapid conversion of sensory impressions into motor impulses, or of morbid reflex action through the medulla oblongata, and it exercises a peculiar influence over the phenomena which are characteristic of epilepsy. Whether the increased excitability of the medulla oblongata is so great as to be productive of epilepsy, or so slight as to extend itself in minor spasmodic complaints, the bromide seems to exert an excellent effect on it. 2. It has a sedative effect upon the action of the heart in certain cases. 3. It lessens and mitigates that rapid and preternatural excitement of spasm, tremor, and other outward manifestations which, in some forms of nervous disease, follow upon any emotional or moral disturbance. 4. It acts as an anodyne, under certain circumstances relieving hyperæsthetical sensations. 5. It promotes sleep. 6. It exercises a sedative influence over the sexual functions. 7. It exercises a beneficial influence over certain mental diseases.—*Ibid.*

A New and Simple Bullet Probe.

Dr. Vincent Geilisch, of Los Angeles, Cal., in the *Pacific Medical and Surgical Journal*, calls the attention of the profession to the effectiveness of white pine wood as a substitute for the famous Nelaton probe. A pine probe-shaped splinter, when introduced into a wound, and rubbed against the suspected object and quickly withdrawn, will present traces of lead equally as well as unglazed porcelain.—*Ibid.*

Sulphate of Zinc vs. Iodine in Injections for Hydrocele.

Mr. Haynes Winslow, of St. Mary's Hospital, Dublin, clings to the rather old-fashioned remedy of sulphate of zinc, of the strength of three grains to the ounce, as an injection for the radical cure of hydrocele. The zinc injection excites more vascular action than the iodine and gives more pain, but the greater assurance of success is more than a set-off in favor of the zinc. He directs that "after the hydrocele fluid is withdrawn the injection should be thrown in with a syringe through a trocar, and kept in the tunica vaginalis till there is pain in the loins and groins, which usually comes on in four or five minutes. Then the fluid ought to be let out."—*Ibid.*

Hyposulphite of Soda in Malarial Fevers.

Dr. W. H. Baxter, of Moscow, Iowa, writes to Prof. N. S. Davis, that he was induced by Dr. Leavitt's statement, in No. 1 of this journal, for April last, as to the efficacy of the hyposulphite of soda in malarial fever, to employ that article. In the last month, Dr. B. says he has treated "over one hundred cases of intermittent and remittent fever with this remedy alone, and in no case has there been an exacerbation after taking the remedy a reasonable length of time." He gave it in fifteen grain doses in solution in water. He has not trusted to this remedy alone in pernicious or malignant types.—*Am. Journal of Med. Sciences.*

A New Caustic.

Dr. Pinckney W. Ellsworth, of Hartford, Conn. (*Medical and Surgical Reporter*), alludes to the discovery by a Mr. Augustus Barnes of the fact that the solar focus is a most efficient and admirable caustic.

Dr. E. states that he "saw one gentleman who had a nævus on his face, extending from the eye to below the mouth and involving the lower eyelid to the very edge, and covering four or five square inches of surface; it was of a deep cherry-red color, approaching purple, and covered with knobs of condensed tissue, an eighth of an inch high. This nævus could be seen as far off as the color of the face. After two applications the spot has nearly disappeared, the skin generally having the hue of a surface blistered some days previously, and it is now nearly well. Some portions were absolutely like normal skin, and entirely colorless. Every knob was gone, and where stood one of the largest, and where the rays were longest condensed, was a perfectly healthy looking cutis. * * * * This man can be considered practically cured, although there is at present the appearance stated, but which does not especially draw attention. * * * * The rays were condensed with excellent success, even on the very edge of the lid. * * * * Nor is the pain as severe as we might apprehend, as it is confined at each instant to a very minute point. * * * * Patients at any rate submit very readily and without the use of anæsthetics." Mr. Barnes uses a lens of two and three inches diameter, condensing the rays upon the object to be removed, and goes over the whole, if not more than three inches in surface, at one sitting. Lupus, Ichthyosis, and small tumors involving the surface of the skin, have been subjected to this experimentation with promising results, at least as far as we may infer from Dr. Ellsworth's communication to the journal above quoted.—*N. Y. Med. Record.*

WORKS RECEIVED.

A Practical Treatise on Fractures and Dislocations. By Frank Hastings Hamilton, M.D., Professor of the Principles of Surgery, Military Surgery and Hygiene, and of Fractures and Dislocations, in Bellevue Hospital Medical College; Surgeon to Bellevue Hospital and to the Charity Hospital, New York; Professor of Military Surgery, etc., in the Long Island College Hospital; author of a Treatise on Military Surgery. Third edition, revised and improved. Illustrated with 294 wood cuts. Philadelphia: Henry C. Lea, 1866; 8vo., pp. 775.

The Science and Practice of Medicine. By Wm. Aitken, M.D., Edin. Professor of Pathology in the Army Medical School, etc., etc.; in two vols.; from the fourth London edition, with additions by Meredith Clymer, M.D., late Professor of the Institutes and Practice of Medicine in the University of New York. Philadelphia: Lindsay & Blakiston, 1866.

A Hand-book of Opthalmic Surgery, for the use of Practitioners. By John Z. Laurence, F.R.C.S., M. B., University of London, etc., etc.; and Robert C. Moon, house surgeon to the Ophthalmic Hospital, Southwark; with numerous illustrations. Philadelphia: Henry C. Lea, 1866.

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MEDICAL COLLEGE OF GEORGIA.

The Medical College in this city is rapidly recuperating from the disasters of the war. The class in attendance this session is double that of the last year.

SOUTHERN

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ORIGINAL COMMUNICATIONS.

The Medical Statistics of the Confederate States Military Hospitals. By WM. H. DOUGHTY, M.D., Augusta, Ga., Professor of Materia Medica in the Medical College of Georgia.

The October number of this journal contains an interesting and instructive article from Professor Jones upon the "Relations of Pneumonia and Malarial Fevers," which incorporated also a "table illustrating the rate of mortality in pneumonia under different modes of treatment, prepared from the hospital and field reports of the Confederate army of America, and also from the published statistics of various European hospitals and armies."

The destruction of the voluminous records of the Medical department at the fall of Richmond has devolved upon individual officers the duty of publishing such portions as may yet remain in their possession, in order to supply the loss as far as possible. In the table adverted to above, Professor Jones has given to the profession a mass of statistics, the value of which will be

duly appreciated by generalizers and statisticians at large. The particular use which he has made of them we can not altogether approve, since so much of the compilation as embraces the Confederate reports *can not possibly reflect the "rate of mortality under different modes of treatment."* The modes of treatment are not given (as in the case of the civil hospitals), simply because it could not be done.

One would infer, from reading this article, that surgeons in charge of hospitals had it in their power to "test the value of the different modes of treatment before the profession," when, alas! the poverty of their resources was painfully prominent. Some of the records which he cites had been completed long before he was in a position to "urge" this important measure "upon each medical officer." His tour of investigation was made long after every vestige of the unfavorable circumstances (not the mode of treatment) which determined the high mortality had disappeared, and at a time when not even gleanings of previous disadvantages could be obtained from officers then on duty. Their comparison with the longest-established, best-organized, and best-conducted hospitals of the old world, with the view of indicating the relative value of the treatment, can scarcely be considered a happy one: in the latter, the *most favorable conditions for treatment under every method obtain*, *while in the former the most unfavorable conditions are coupled with an unselected mode of treatment.*

The fact, therefore, "that the mortality from pneumonia in a large number of Confederate hospitals was greater than the mortality in this disease *under the different modes of treatment in European hospitals*" loses its importance, since it can not be taken as a test (as was designed) of the methods of treating the disease in the South. The results were worse than the worst there employed, because the conditions, not the manner, of treatment were so also.

We venture to assert that our medical officers, as a general rule, had no choice in the matter: in many cases they had to improvise the means of treating disease, and, disregarding for the moment mere medicines, could not so much as command suitable dietetic measures. If their facilities had equalled, we shall not presume to say those of the European hospitals, but those of their implacable enemy, who condemned as contraband of war even medicines and instruments, they would now have no reason to shun the comparison.

While mournfully admitting that their hospital records are "bad enough," indeed "no better, and even worse than the heavy mortality characteristic of the rigid antiphlogistic method with bleeding, blistering, calomel, and opium, and tartar emetic," they can yet proudly challenge the charity of the profession by an exhibition of the desperate circumstances under which they contended with disease. Destitute of the means and conditions necessary to success, *their records only prove that soldiers, like others, will die in great numbers when adversely situated.*

We are not attempting a criticism of this article, nor a mere defense of Confederate surgeons: simply wish to place in proper connection with the disastrous record those unfavorable conditions which had more to do in producing it than the worst system of therapeutical management possible. Surgeon Jones was too generous and courteous an officer to cast censure even inadvertently upon his colleagues-in-arms. Although familiar with their embarrassments, he will doubtless be gratified with the publication of all the *conditions* which determined or influenced the gross results which he has manipulated.

Having organized and had charge of one of the hospitals* which he cites for eleven months (April, 1862, to

* Floyd House Hospital, then known as General Hospital, Macon, Ga.

March, 1863), when its highest mortality occurred, we have better knowledge of the circumstances connected with its mortality, and have the pleasure of giving to the profession the first sanitary report of that institution, as evidence of the facts stated. Surely, they will agree with us in the exclamation that "under such circumstances it is not astonishing that many died—nay, it is rather more so that more had not died."

SANITARY REPORT,

Accompanying the Report for the quarter ending June 30, 1862.

Reports of this kind are expected to reflect all the circumstances that may have influenced the mortality at this post, or modified the type of its prevailing diseases. In the present instance, a brief notice of the circumstances that led to the establishment of the General hospital at Macon, Ga., should be given, since it will bring to view the first of a series of influences highly prejudicial to those who were to be benefitted by it, viz.: the improper transportation of the sick.

After the fall of Fort Pulaski (April 11th) the military authorities, apprehending an attack upon the city of which it was a defensive outpost, ordered the immediate removal of the sick at and in its vicinity to the interior. Unfortunately, this removal was attempted and executed without discrimination as to the condition of the sick or their ability to stand it; the necessity of the case outweighed the question of propriety, and all alike, the convalescent and the critically ill, were hurried off to a place of safety.

The greater part, perhaps 220, of those sent here were from Camp Davis, on the Central railroad, where they had rendezvoused about the middle of March. The remainder (60) were from the Savannah hospitals. The former, particularly, were raw and undisciplined; were chiefly from rural districts, and characteristically careless of all those important hygienic rules which, whenever and wherever violated, are sure to inflict misery and suffering. While at the camp of instruction the weather was exceedingly inclement, being both damp and chilly from the heavy rains that fell during the early spring and its changeable winds.

Rubeola, parotitis, pneumonia, etc., the scourges of our camps, soon appeared and spread rapidly among the troops, laying the foundation for those diseases commonly recognized as their sequelæ. At this juncture it was attempted to transport them to this city, a distance of 160 miles, in box cars, without a single comfort other than a scanty supply of straw. During their transit it continued raining and damp,

and after their arrival at this place they were conveyed upon open vehicles, through a drizzling mist, to a place provided for their reception.

The latter, like most *provisional* hospitals established in a period like the present, being intended only to meet the emergency that gave rise to them, afforded but a feeble respite from the disagreeableness of their situation for the previous 36 hours. But two days' notice had been given the city authorities in which to provide for so large a number (280), and it was found impossible to obtain clothing or hospital furniture of any kind sufficient to meet the exigency. The building was at that time occupied as a low-class hotel, and was exceedingly filthy and unclean. It consists of two wings at right angles to each other, and located in the southeastern part of the city, at the intersection of two streets running northeast and southeast. It is very old and the interior much decayed in parts and is subdivided into 75 small rooms, the largest of which can only accommodate ten beds. The halls are narrow, running through the centre of each wing, with frequent interruptions by ascending and descending staircases. The second and third stories are used for hospital purposes, the stores on the first being let out to Jews and Irish of a low class.

Moreover, the exigency required the retention of the hotel bedding and other articles of furniture, and upon these the wearied sick of every disease were indiscriminately thrown; in some instances two and even three occupied the same bed. The floors were still covered with carpets that had not been removed for years; and to all this was superadded an insufficiency of nurses, food, and clothing.

At the time of our assignment to duty, 24th April, and even to the early part of May, many of the sick wore the same clothing that had been used in camp, and upon exposing their skins the accumulations were very nearly as thick as the cuticle itself. Volunteer physicians and nurses did their utmost, but what could they accomplish? Ochlesis had done and was still doing its work, and nothing but a return to the innovated laws of hygiene could save those who apparently only awaited their turn for sacrifice.

A few of the sick died shortly after reaching their quarters; frequent relapses occurred among those convalescent; and the most dangerous sequelæ of their respective diseases manifested themselves. Very soon the evil effects of crowding, want of ventilation, and uncleanliness began to be manifest in the aggravated type of disease and its fearfully increasing mortality. For several weeks the above conditions obtained, and the result was an assemblage of disease of most appalling and malignant character, as pneumonia typhoides, febris typhoides, erysipelas, and one case of phagadæna.* The mildest

* These occurred principally as secondary diseases or relapses, and therefore do not appear so fully in the return, the diagnosis of the primary disease having previously been entered.

cases were manifestly assuming a low nervous (or typhus) condition. Parotitis, usually the simplest of the diseases of childhood, was followed by acute meningitis and pneumonia typhoides, rubeola by febris typhoides, pneumonia, and bronchitis capillaris; and the few cases of febris intermittens that were then present readily assumed a typhoidal aspect. Under such circumstances, it is not astonishing that many died—nay, it is rather more so that more had not died. As an evidence of the disastrous effects of these influences, there occurred between the 13th of April—the period at which the hospital was opened —and the close of the month, nineteen deaths, three of which were from febris typhoides, seven from rubeola, the sequel of which was pneumonia, and nine from acute pneumonia. Moreover, fourteen-fifteenths (14-15) of the mortality for May occurred among the subjects thus exposed, and twelve-fifteenths (12-15) of the number by the 15th of the month (as will appear by the register of the hospital) and during the continuance of the above injurious circumstances. One of the deaths from febris typhoides was a relapse about that period.

It thus appears that thirty-four (34) *of the forty-one* (41) *deaths reported for the quarter are ascribable in a great measure to the prejudicial circumstances surrounding the sick during and after removal from camp.*

It was not until the middle of May that good nursing, well-prepared food, cleanliness, and other proper hospital accommodations were provided for the sick, since which time the type of the prevailing diseases has changed and the mortality become greatly diminished, as will appear by the mortality for June—less than half that for May—although at one time during the former there were 179 cases on hand.

Respectfully submitted.

WM. H. DOUGHTY, Surgeon in Charge.

In connection with the above report, we would beg leave to remind our readers that, under the military forms employed for the registration of diseases, neither the hospital register nor the reports of sick and wounded based upon it present a record correct and complete in every particular; the *medical* statistics, as contradistinguished from the *surgical*, are rendered incomplete, from the fact that "Form II" of the Regulations, which is the one prescribed for the register, makes no provision for the registration of *secondary* or *supervening cases*, which, under some circumstances (as under those depicted in the

above report), become very prominent in hospital experience. The form requires the entry of the *original* or *primary* "complaint," but the secondary are unprovided for, unless the surgeons feel interest enough to prompt its notation among the *incidental* facts pertaining to the case, under the general head of "remarks." This places it upon so insecure a basis as to cause its oversight in many instances, and to restrict this method of recording them to the most striking cases. The reports are mere transcripts of the register for the time embraced, and must inherit its imperfections. Our attention was drawn to this defect at an early period, and we took the liberty of suggesting an alteration in the form, in order to secure greater accuracy. Toward the close of the war a new form was adopted which served the purpose, but the value of the antecedent reports was already impaired. This is no inconsiderable circumstance. We are satisfied that many cases escape record in this way, except in the event of the death of the patient. Many, perhaps the majority of cases of pneumonia and all other affections of an intercurrent or secondary nature, that occurred at General hospital, Macon, Ga., were noted incidentally, and some probably omitted, but unless the *reviewer* was careful to examine the incidental remarks, there would be great danger of mistaking the actual number treated. *It is very possible, then, for the results of treatment to appear less favorable, or the proportion of deaths to appear much greater, where the primary diseases are alone made prominent.*

Since the close of the war we have been informed from the Surgeon-General's office that, in regard to secondary diseases, "it was deemed impracticable in time of war to use a form of return so complicated as would be necessary for their full registration."

The Legal Status of the Profession in Georgia.

[The following article is from a legal gentleman of this city of acknowledged ability, also a graduate of medicine, and will be read with interest by the profession.—Ed.]

It will be new to many in the profession to know that physicians who have commenced the practice of medicine in this State since the 6th of March last, and have charged fee or reward, are liable to indictment under the penal law, and, upon conviction, to be fined $500, and for the second offence to imprisonment in the common jail of the county; and farther, that all physicians not in practice on the 1st day of January, 1863, are not legally authorized to pursue their profession, at least can not enforce compensation therefor. Stranger, however, is the fact that hydropathists and homœopathists are not obnoxious to these strange and harsh provisions. These gentlemen, and all other outsiders, except followers of the "reformed practice of medicine," so called, are favored by our law to the extent of being authorized to practice and charge for the same under diploma alone.

A brief review of the history of our State legislation relative to physicians and their license to practice, will show how these absurdities have been evolved from the hands of our law-givers, and may, we trust, by drawing attention thereto, effect an organic change in the law as it now stands upon the statute-book.

The law should be, to a learned, liberal, and benevolent profession, a stay and prop: it has become a snare and pitfall.

In order to insure her people against the effects of ignorance, imposture, and empiricism—from the wiles of the quack, charlatan, and mountebank—the Legislature of our State, so early as in 1825, established a board of

physicians who were annually to assemble, to examine applicants in all the branches of medicine, and thereupon to grant or refuse licenses to practice medicine and surgery. No one (excepting such physicians and surgeons as were at that time in the practice) was allowed to prescribe or perform an operation and charge therefor without a license had been first had of this board. In order to make this provision effective, no debt, no matter what shape of bond or note the obligation had assumed, or into whose innocent hands for value such note or bond might have come, could be collected, the consideration of which was the medical services of one who had not been duly licensed. And to add a still stronger sanction, it was enacted that, should any person thereafter presume, without such license, to practice physic, surgery, or in any manner prescribe for the cure of disease for fee or reward, he should be liable to indictment, and on conviction should be fined a sum not exceeding $500 for the first offence, and for the second to be imprisoned not exceeding the term of two months. If any applicant had received a diploma from any Medical college, the board were to license without examination; but this was modified a few years later (1831) by an act which made it incumbent on the board to examine in all cases, notwithstanding the exhibition of a diploma, when a doubt arose as to the qualifications of the candidate, and by the same act it was declared unlawful for the board to license any person whatsoever who should not have produced before it satisfactory testimonials of good moral character.

The board itself was invested with all the rights and powers of a corporation—to hold property, real and personal, to keep a common seal, sue and be sued, to make by-laws for its government, and to maintain its perpetuity by filling vacancies occasioned by death, absence, resignation, or otherwise. The book in which the names of the

licentiates and the dates of granting the licenses were entered was raised to the dignity of a record, and a certified transcript from the same was declared competent as evidence in every court of justice in the State.

The whole spirit of these acts (1825–1831) and every letter of them, manifested an intention on the part of the Legislature to render this board one of the fixed and permanent institutions of the land.

Had the scheme been fully carried out, according to the design of its contrivers, it is not difficult to conceive the good it had accomplished. Not only would the citizen have been protected against the blunders of the illiterate and the vices of the sharper, but much reproach would have been arrested which has fallen on the followers of our calling. A license would have afforded presumption at least of fair acquirement and of good character on the part of its possessor.

The board of physicians, with its corporate powers and ample discretion, had hardly commenced its sessions, and entered upon the performanee of its high trusts, before its action was rendered ineffectual, and barren of good results. So soon as an applicant had been refused a license for want of character or lack of attainment, he applied to the Legislature for relief, and this body never failed to pass a private act in his behalf, and to grant him those privileges which the board had, under the obligations of their office been forced to deny him. The discovery was made in a short time, that it was less expensive, as well as more convenient and certain, for the candidate to apply to the Legislature for license than to repair at some appointed time and place and stand an examination by the board. The latter cost time and money and was of doubtful issue, while the former was certain in result, required only the promise of his county member, and cost nothing but a vote.

The functions of the board become idle as the wind, and that body soon closed its sessions. The act was repealed in 1836, revived in 1839, and re-enacted in 1847, when a new board was nominated. At the same session a Botanico-Medical board was instituted by the Legislature with the same powers and duties in reference to candidates for practice in this persuasion. This fact of itself was sufficient to render nugatory any and all action of the regular board, but the same old causes continued to operate and defeat the good which was intended to be accomplished. At every session of the Legislature acts were passed with muster-rolls of names who were authorized to practice medicine and surgery, and charge for the same without farther license. As a sample of these we may instance one, in which this authority was given to "practice medicine on the *Dutch and Indian* plan." The board met but once or twice, if at all, and had discontinued its functions, when in 1854 an act was passed authorizing any graduate of a Medical college of the United States to practice medicine and surgery, and to charge for the same.

Thus stood the law of Georgia when the *Code* was adopted (1862). The Code substantially re-enacted the act of 1825, declared there was in this State a board of physicians of the allopathic school of medicine, and also a board of physicians of the reformed practice of medicine, conferred on each the like powers and duties, declared debts not collectable without a license from the one or the other, and made the practice for fee or reward without a license penal by fine and imprisonment. Thus these provisions only repeated what had been on the statute-book, but the anomaly was produced by adding what was not before known to the laws of Georgia. Section 1,348 provided: "Neither board can license persons to practice in a school different from their own. *Physicians belonging*

to a school of medicine not represented by a board of physicians may practice under their diplomas alone." The Legislature of 1866 made a few alterations, such as that of the act of March 6th, which declared that the penalties for practicing without a license were not to be enforced against physicians practicing since the adoption of the Code and before the passing of that act. And the act of March 9th, which exempted from the provisions of the Code all who were in practice under legal diploma on the 1st day of January, 1863.

So that at this day the law upon our statute-book reads: If the graduate be of the regular school of medicine, he must first obtain a license before he shall attempt to gain a livelihood in the pursuit of his profession, from a board of physicians, which the law says exists, but which in fact does no such thing. He is, therefore, required to do work gratuitously, or subject himself to criminal punishment. But if the graduate be Hydropath, Homœopath, or Dutch and Indian doctor he has full authority to practice and charge by virtue of his diploma, which throws around him a mantle of protection from those penalties to which the learned, scientific, regular practitioner is made liable.

Ita lex scripta est. It seems it should only be named to be speedily abrogated.

A Case of Knee-joint Resection. By A. W. BAILEY, Surgeon 1st Reg't S. C. V. Infantry.

Lieut. J. W. Harlee, Co. I, 1st Reg't S. C. V. Infantry, Bratton's brigade, age about twenty-seven years, and of robust constitution, was wounded in the battle of the Wilderness, May 6th, 1864. A minnie ball passed laterally through the right knee-joint, fracturing the head of the tibia. A curved incision was made, extending from one condyle to the other, reaching just below the inferior

border of the patella. All the ligaments with the synovial sac were divided, and the semi-lunar cartilages removed. A transverse section of the head of the tibia, embracing the fractured portion, was made above the articulation with the fibula. The patella was not ablated. The wound was closed with sutures and adhesive straps, and the limb secured to a long outside splint. The next day he was transported about twenty-five miles over a rough road to the rear, and two of the sutures cut out, thereby exposing the internal condyle. In a short time the exposed surface was covered with healthy granulations, and the space soon filled up. In the course of six or eight weeks true anchylosis had taken place, and the wound healed, except a small place where the condyle was exposed, leaving a small fistula, which healed in a short time afterward. This officer, who returned to his command to be retired on the invalid corps, gives the following account of the treatment carried out after being sent to the General hospital: He was furnished with a quart of good whiskey daily, and requested to drink as much as he could, and use the balance on his leg. He says he drank the quarter portion each day, and dressed his wound twice daily with one part of whiskey to three of water. His leg is about three inches shorter than the other, wears a high heel and thick sole to his boot, by which means he is enabled to walk without crutches, and even dance with ease.

Barnwell Dist., S. C., Dec. 13, 1866.

Surgical Pocket Case. By L. A. DUGAS, M.D.

In the construction of pocket cases of instruments for the use of general practitioners of medicine and surgery, the makers have heretofore seemed to be governed by neither fixed principles nor definite purpose. The consequence is, that these cases differ exceedingly in the kind

and number of instruments they contain, and are rarely found to answer the purpose for which they are obviously intended.

A pocket case should contain not only such instruments as are of daily use in practice, but also such as may be needed in cases of emergency, which require immediate action. This is especially necessary with country practitioners who may be at considerable distances from home when called upon for professional services requiring the use of instruments. A pocket case should, therefore, not be a mere dressing case, but one adapted to the relief of all affections which demand prompt attention.

The instruments, moreover, should be made by the most approved patterns, in order to be useful: for there is nothing more disagreeable than to have to depend upon ill-shaped or otherwise badly-constructed instruments. They should be made light, and placed in a morocco case provided with a good clasp.

With these views, I had a case made many years ago for my own use, by Charriere, of Paris, and have endeavored to have similar ones manufactured in our country. The greatest difficulty encountered by our dealers has been in securing instruments made from good models. Few, if any, of our manufacturers seem to understand the importance of working with approved models, and the consequence is that very many of their instruments are comparatively worthless. Charriere, by devoting his life to the business, has succeeded in adapting his instruments to the wants of the surgeon more effectually than any one else; and his patterns should, therefore, be adopted in this country.

My case is constructed as follows:

1. Jointed silver caustic-bearer (porte-caustique), divided into three parts: one for nitrate of silver; one for sulphate of copper; and one containing a cataract needle,

for the removal of motes from the cornea, etc. The closed instrument is four inches long, but may be lengthened to five and a half inches by inverting the joints. This is one of Charriere's most ingenious contrivances.

2. Female silver catheter, with jointed extremity, which may be removed to give place to an adult or an infant male catheter of the same metal, also contained in the case.

3. Dissecting forceps with slide, so as to be used as artery forceps, the extremity being so rounded as to allow the ligature to slip over it and lodge upon the artery. The inner surface of the jaws serrated and grooved, to serve as a needle or pin bearer.

4. A thumb lancet.

5. Delicate dissecting forceps for extracting bodies in the nostrils and ears, eye-lashes, etc.

6. Spatula of soft iron, which may be bent for use as a curved spatula; the other end being of hard steel, terminating in a serrated point, for use as an elevator of fractured cranium.

7. Belloc's instrument, for arresting nasal hemorrhage.

8. Scissors—strong, straight, and blunt pointed.

9. Ear scoop with tumor hook at the other end, which may be made double by drawing down a slide.

10. Silver grooved director, with the handle split so as to serve for cutting the frænum linguæ.

11. Two silver probes with eye; different sizes.

12. Two silver probes with grooved director; different sizes.

13. A tent-bearer (porte-mèche).

14. Polypus and shot forceps, as long as the case will admit; will do also for dressing wounds, removing bodies from the pharynx, etc.

15. Dupuyten's æsophageal hook and probang; with three joints, so as to be admitted into the case.

16. Large and small convex bistouris in one handle, with slides or spring backs.

17. Large and small straight bistouris in one handle, etc., etc.

18. A straight, probe-pointed bistouri of usual size, and a very small and sharp-pointed straight one, for opening whitlows, abscesses, etc., in one handle, etc., etc.

19. Gum lancet and grooved exploring needle, in one handle, etc., etc.

20. Tenaculum and artery needle for ligations, in one handle, etc., etc.

21. Six semi-lunar suture needles, and six straight ones, of assorted sizes.

22. Silver wire and saddler's silk, for sutures.

The handles of the double instruments should be made of tortoise shell, and should be long enough for the blades at each end to work easily, with slides or spring backs.

The cost of such cases may be lessened by substituting German silver for the pure metal, and some other material for the tortoise shell. But when we consider that a good pocket case will last one's lifetime, it will be found cheaper in the end to get the best at first.

The case which contains these instruments is, when closed, six and a half inches long and three inches wide. When open its greatest length is eight and a half inches, including the flap for clasping. It folds in the middle. With contents complete, it weighs only twelve and a half ounces. Thus constituted, the case actually contains thirty-two instruments, besides the needles, wire, etc., in such a small compass as to make it portable as a pocket companion without inconvenience.

ECLECTIC.

Bromide of Potassium in Epilepsy. By HORACE Y. EVANS, M.D.

It is a matter of surprise that the bromides of potassium and ammonium have not come into more general use in the profession.

Dr. Hammond's little book awakened some of us to a realization of the fact that insomnia could be successfully treated without the use of opium; and further, that in many cases of wakefulness it was positively contraindicated; yet how very few think of using the bromide of potassium in this affection.

Sir Charles Locock made public, years ago, his successful use of this remedy in hysteria; yet the old and offensive drugs are to this day used nine times where the more agreeable and effectual bromides are used once.

Delirium tremens can be throttled at its very outstart by this medicine, yet how rarely does a case in private practice escape the routine of opium, alcohol, blisters, digitalis, lupulin, and capsicum. In no disease have their beneficent effects been more marked than in epilepsy.

I propose, therefore, relating the three following cases of this disease out of eight within my knowledge, treated with the bromides.

Case 1. Farmer, aged thirty, living in a miasmatic region. Enjoyed perfect health until attacked with ague; was treated with quinia, and the chills checked. Then followed convulsions, which at first resembled, as far as the pulse was concerned, apoplexy, but soon became clearly epileptic. The attacks returned at irregular intervals of from seven to ten days. He had been carefully treated with remedies such as the symptoms from time to time indicated. When he came under my care he was using tonics and alteratives, and ice-bag to the spine.

His pulse was 98, full and strong, tongue furred, bowels sluggish, disgust for food, very restless, severe headache, and marked mental confusion. I continued the ice-bag to his spine half hour daily, ordered saline purge every day, and farinaceous diet. He was very soon visited by another convulsion, which left him in a dull melancholy condition, severe headache and insomnia, but no paralysis; commenced next day with the bromide of potassium, gr. xv, three times a day; continued the saline mixture, ice-bag, and restricted diet. An improvement in all the symptoms commenced within twelve hours, and at the expiration of four weeks the patient was apparently well; there was no return or tendency to return of the convulsion. All treatment was then omitted, and at the expiration of seven weeks from the commencement of the treatment, considering himself well, he returned to the use of animal food, which was followed within ten hours by the most severe epileptic fit of any that he had had, and two days later by another. He then returned to the city and was again put upon the use of the bromide and the ice-bag. As at first, the improvement was rapid, and at the expiration of a fortnight, without my consent, omitted all treatment. He returned to the country, used promiscuous diet, and has now passed through the fever season of the locality without ague or convulsions. Says he was never in better health than at present.

Case 2. G. M—, a young man twenty-one years of age, apparently in a good physical condition, has had epileptic convulsions for the past fifteen years, and at the time of commencing his treatment (March, 1866) he was having, on an average, three attacks a day. He was ordered a saline purge twice a week, ice-bag to spine one hour daily; bromide of potassium, gr. xx, three times a day, and total abstinence from animal food. The interruption in the attacks was immediate; he continued without even

an "aura," or any other evidence of the presence of the disease, for nine consecutive weeks.

The peculiar effects of the bromide, named by Bazire bromism, having now become developed, the drug was omitted for two days, Huxham's tincture of bark, and a more liberal diet substituted. Before the end of the second day, a severe convulsion returned, and was followed by numerous aura epileptica or minor "spells." The bromide was immediately resumed, and its use continued for three weeks without a return of the disease. The increased flow of saliva, sore throat, and restlessness, again gave premonitions of the return of bromism. The dose was now reduced to gr. x, ter die. Again the lurking foe took advantage of the truce and made several sorties, which were repulsed by the bromide of ammonium, with the iodide of potassium as an ally. Another month now elapsed without an attack, but the combination last used became so offensive to him that it had to be omitted, and the bromide of potassium resumed in gr. xx doses, which is now (November) being used with results beyond the most sanguine anticipations.

Case 3. Mrs. S. B—, aged twenty-eight, the mother of two children. Insanity and epilepsy in her family. After a serious family trouble, was attacked with convulsions at intervals of a fortnight. The disease was diagnosticated hysterical epilepsy, chiefly on account of the long duration of the convulsion. The usual treatment for hysteria scarcely palliated the insomnia and almost delirium during the intervals. Having seen an account of Locock's treatment of this disease with the bromide of potassium, I was induced to give it a trial. She commenced with gr. xx doses three times a day, and an additional dose at night if necessary to produce sleep. Within a week every vestige of the disease had vanished. The medicine was continued in reduced doses for a month,

after which it was entirely omitted. Four months have since passed without a symptom of hysteria or epilepsy, notwithstanding the continuance and actual increase of her family troubles.

I have in my possession notes of other and aggravated cases of this disease, which have been so far interrupted and modified by this treatment, that the patients have been enabled to commence life almost anew. The three just given are the forms with which we most frequently meet, and therefore cover the whole ground; namely, first, those having an apparent or known cause; secondly, congenital; and lastly, hysterical. The first and third, we have reason to believe, are cured. The second is so far palliated as to give periods of entire exemption ranging from three to four months. The *modus operandi* of this drug has never been satisfactorily explained. The authorities tell us that it has alterative, resolvent, and sedative effects upon the nervous system.

Looking as we do upon the convulsion as a symptom of the disease, and that the disease consists of an irritated and congested condition of the brain, medulla oblongata, or spine, then the ice-bag comes in as an important auxiliary in producing sedation—though in numerous cases the drug has performed the whole work single handed. It seems to me that the field of usefulness for this medicine is very extensive. It dispels a large proportion of the aches and pains met with in women. Neuralgia, refusing subservience to all other treatment, has yielded to this. So also with chorea, headache, and the forming stage of delirium tremens. It palliates the paroxysms of pertussis. Dr. M. A. Withers, of Pottstown, related to me a case under his care, of melancholy, culminating at times in insanity, which has been so far improved by the use of large doses of this medicine as to give strong hopes of eventual recovery.—*Am. Jour. of Med. Sciences.*

Use of the Thermometer in Diagnosis and Prognosis.

The number of the *New York Medical Journal* for November last contains some interesting remarks by Prof. Austin Flint on the thermometric phenomena of disease, a subject which has latterly engaged the attention of clinical observers in Germany and Great Britain. The following propositions contain the substance of his remarks:

1. The thermometer is indispensable for obtaining accurate information of the temperature of the body, the perceptions of patients and the sense of heat or coldness communicated to the hand of the physician being alike fallacious.

2. In the essential fevers and all acute affections, the heat of the body is more or less above the maximum of health; and the increase of heat, as a rule, persists during the career of the disease. Fevers and acute affections may, therefore, be excluded by the fact of the heat of the body remaining within the limits of health; and the existence of an essential fever or an acute affection of some kind may be predicated on a persistent increase of heat.

3. A fever is purely malarial, that is, it is not a continued fever, nor is it associated with a continued fever, if, between the exacerbations, the temperature fall nearly or quite to the range of health.

4. The diagnosis of neuropathic affections which simulate inflammations may be based on the fact of the temperature not being raised.

5. Coma from uræmia may be discriminated from the coma occurring in fevers or dependent on meningitis, by finding the temperature not raised; and in cases of uræmia, coma, and convulsions, intercurrent inflammatory affections may be excluded if the temperature remain normal.

6. In tuberculous affections, when tuberculization is going on, there is more or less increase of heat. In cases of suspected tuberculosis, a normal temperature shows either that tuberculosis does not exist, or, if existing, that it is not progressive.

7. In cases in which the history and symptoms excite fears of the existence of meningitis, the existence of this disease is not probable if the temperature be not increased; and, on the other hand, increase of temperature sustains these fears, provided the patient have not an essential fever.

8. The amount of increase of heat, as shown by the thermometer, provided the increase be not transient, is proportionate to the gravity of the disease, and is a criterion of the immediate danger. A persistent temperature of 105° always denotes great severity of disease, and a still higher increase renders it almost certain that the disease will speedily prove fatal.

9. The temperature in the different essential fevers and inflammations is governed by certain laws as regards progressive increase, daily fluctuations, and the rapidity or slowness with which it returns to the normal standard (defervescence) of the time of convalescence. Each essential fever or inflammatory affection has its own laws in respect of the points of difference just named; and any notable deviation from these laws, in individual cases, is an unfavorable prognostic. Thus, a decrease of heat below the normal range may indicate an internal hemorrhage, and a sudden increase may point to an important complication or the occurrence of an intercurrent affection. Mildness of the disease, and the absence of complications or intercurrent affections may, on the other hand, be predicated on the disease pursuing its regular course as regards temperature.

10. The surest evidence of convalescence from an es-

sential fever, or an acute inflammation, is a return of temperature to the normal standard. If an increase of temperature persist, after apparent convalescence, or, in self-limited affections, after they have reached the end of their career, either morbid conditions pertaining to the disease continue, or some affection has been developed as a sequel to the disease.—*Ibid.*

Night-Blindness in the Confederate Army. By Robert J. Hicks, M.D., Williamsburg, N. C.

This is a curious and obscure disease, called, according to Lawrence, nyctalopia, as often as hemeralopia, and as, according to the same high authority, these learned terms have been the cause of great confusion, I have preferred the simple English term, because it is free from all ambiguity. While the highest authority is on the side of hemeralopia, philology would rather support the latter—nyctalopia being derived from the Greek, meaning incapacity on the part of the eye to transmit the impression of light at night. While in the army I, with others, were in the habit of calling this disease hemeralopia. Medical writers seem to differ as widely, with regard to its cause and pathology, as they do in reference to its appropriate name. And the accounts hitherto published have been so meagre and contradictory, that I thought a more extended notice might not be unacceptable to the medical profession, especially as it was a source of such very great inconvenience in our army, although not a serious affection in the great majority of cases.

For a disease so common in armies, it seems to have attracted but little attention. It is casually noticed by Baron Young, in Napoleon's Egyptian campaign; called forth a short report in the Crimean war, and has a short notice from Lawrence, and about half a page from Littell.

It is said to occur occasionally at sea; is very rare in private practice; but prevailed in the Army of Northern Virginia so extensively as to resemble an epidemic. Soldiers attributed it to the effect of the moonlight falling upon their eyes while sleeping upon the ground. Among medical writers it is considered by one "a species of amaurosis;" by another "a species of impaired sensibility of the optic nerve," and by others a "sort of paralysis of the retina," generally concurring, however, in the belief that the disease has its seat in the nervous apparatus of the eye, and that its cause is to be found in the effect of excessive light. While differing from their opinion, I shall not discuss them; but on the contrary give the simple result of my own observations.

This disease prevailed most extensively in the Army of Northern Virginia, when encamped in the vicinity of Fredericksburg. The affection is gradual in its approach and development. The soldier, who had marched all day without inconvenience, would complain of blindness upon the approach of early twilight, and make immediate application for transportation in an ambulance. At such times he would be found blundering along just as a blind man, holding on to the arm of his companion. There was an entire absence of all constitutional symptoms, and the eyes appeared, upon inspection, perfectly natural. Sometimes both eyes were affected, but frequently only one. In the latter case little complaint was generally made. It was not, therefore, surprising that medical officers should have been sceptical regarding the very existence of the disease, and should have frequently accused the patient of malingering. I confess I shared in this feeling until accident placed in my way what I consider a certain means of deciding the existence of the complaint. It is the use of simple candle-light in the examination of the eye, after the sun has disappeared. To such light the

pupils refuse to respond; and such was the uniform result in all my examinations. It was a curious circumstance, that the pupil should remain dilated, and the patient fail to see—that the ciliary nerves and the retina should lay aside their functions as soon as the sun disappeared, to resume them again upon his rising. Observing this fact, and justly attributing it to the more stimulating quality of sunlight, I concluded that the affection consisted in a want of tone in the nervous apparatus of the eye—a condition of enfeebled local innervation, reaching no farther than the retina, and a branch of the ophthalmic nerves. The remedy successfully used confirms this view. Cupping, leeching, blistering, mercury, and iodide potassium, were used extensively, but in my hands did harm rather than good.

Cases frequently recovered spontaneously, after all treatment had been abandoned. But a great many of them were very obstinate—yielding to nothing within the hands of medical officers, except a furlough, and this was the grand remedy, failing in no instance that came under my observation. The disease resulted from the meagre diet, the absence of vegetables and vegetable acids, and other depressing influences of a soldier's life. The proof of this is found in the fact that the removal of these influences and the substitution of those of home—its cleanliness, improved diet, and relief from mental anxiety and physical exhaustion, never failed of effecting a speedy cure. It is furthermore well known that poverty and want and filth are the fruitful sources of those affections of the eye which are most similar to this, and which are of most frequent occurrence in the degraded portions of the populations of large cities.

As before remarked, in the great majority of cases this disease is little more than an inconvenience—a simple

inability to see at night, with no other unpleasant symptoms. Littell, however, remarks that, although the prognosis is generally favorable, if not treated properly incurable amaurosis is apt to follow. Among the very large number of cases that came under my observation, there never was any such result. There was, however, of this number, amounting probably to more than a hundred, one of great interest, because it seemed that this debility of the nerves of the eye extended to the brain, and produced a fatal result. Our records were all lost at the surrender of General Lee, and I can, therefore, give the history of the case from memory only.

It was in the person of a private of the twenty-third North Carolina regiment, and occurred at Williamsport, Maryland, after a long and fatiguing march down the Valley of Virginia. When first brought to me, this soldier was found to have been suffering for several days from inability to see at night. Being examined at night by candlelight, the pupil was found dilated, and refusing to respond to the stimulus of this inferior light. On the next day he complained of considerable debility. In the course of the day, this debility had increased, and was attended with some obtuseness of intellect. The pulse became weaker, and there was a disposition to coolness of skin. When night again came on, the night-blindness was still farther aggravated. The stimulating plan of treatment being clearly indicated, was used, but failed utterly to retard the progress of the disease. On the next morning all the above symptoms of depression had become greatly aggravated, and within seven or eight hours he died without a struggle. Being interested in this disease, I watched the progress of this case with great interest, and it seemed to me to be essentially one of debility or depression. The enfeebled or atonic condi-

tion of the nerves of the eye seemed to quietly but rapidly extend to the great nervous centres, depressing them beyond the point at which vitality was possible.

It may be possible, but I think it hardly probable, that these two affections—the one of the eye and the other of the brain—should have been coincident only; for the one seemed quietly to deepen into the other, in a similar and most connected manner. There was a gradual exhaustion of all the sources of life—death steadily proceeding from circumference to centre. There was an entire absence of delirium—trismus and spasmodic action of the muscles of the back, attendant upon cerebro-spinal meningitis, under which head, no doubt, some would have reported it.

Should this complaint be met with in private practice, which, though very rare, occasionally happens, the proper plan of treatment, as deduced from the above facts, would be the use of those articles calculated to give tone to the system. Iron might be used with advantage, as protracted cases are apt to become anæmic; and as the disease is most prevalent when symptoms of scurvy manifest themselves, vegetable acids, in all probability, would be of service. These are not only great anti-scorbutics, but may be considered tonic, inasmuch as they perform a very important part in the digestion and assimilation of food. It is also highly probable that some local stimulating application, as advised by some, might be of advantage.

But to comprehend the whole plan of treatment in a few words, I would recommend, in the first place, to remove all known or supposed causes—a recommendation that applies as well to all other diseases; and in the second place, to follow that plan of treatment which approximates most closely in its effect to that of a furlough upon a soldier.—*Richmond Med. Jour.*

"*On the Law of the Sexes;*" *or the Production of the Sexes at Will.* By Joseph Le Conte, M.D., Professor of Chemistry and Geology in the University of South Carolina, Columbia, S. C.

The following is a very brief extract, condensed from the *American Journal of Science and Arts*, for July, 1864, and January, 1865, of an important memoir of M. Thuny, of Geneva, and of an account of some experiments of M. M. Coste and Gerlee on the law of the sexes. The original memoir of M. Thuny was published in the *Bibliotheque Universelle* in 1863, but, as we have seen no notice of it in the agricultural or physiological journals of the South, we think the intelligent public, as well as the medical profession, will be interested in this abstract.

M. Thuny was first led to his conclusion by the following well-known facts:

1. The fundamental or morphological identity of the sexes. From this he concludes that the difference of sexes is due to slight differences in the process of development of the ovum in its earliest stages.

2. That in plants (those which are unisexual), the character of the sex may be controlled by the management of external agents.

3. That, according to Huber, ova of the bees, if fecundated early, produce workers (females), whilst, if fecundation be retarded until the twenty-second day, all the eggs deposited produce males.

For these reasons M. Thuny concludes that the sex is determined previous to fecundation, or rather by the maturity of the ovum at the moment of fecundation.

It is well known to physiologists that there is a development, and therefore a history to the ovum previous to fecundation. If no fecundation takes place, the development is arrested at a certain stage, and the ovum perishes;

but if fecundation occurs there is a new accession to life's force, which suffices to carry it through all stages of embryonic and extra-uterine life.

Now, according to M. Thuny, during the earlier stages of the anti-fecundation history of the ovum, the sex is female; but if the development continues without fecundation it becomes male. By impregnation the sex is fixed for ever. If, therefore, impregnation takes place while the ovum is immature, and its sex therefore female, the embryo will be female; but if fecundation is delayed until a late period, when the sex of the ovum has become male, then the embryo will become male.

It is easy to see the important practical applications of the law. In uniparous mammalia the ovum leaves the ovary at the beginning of each rutting period in a very immature condition, and passes slowly through the fallopian tubes, the uterus, and finally, if unfecundated, is discharged.

Now, during the whole of this slow passage, the ovum is maturing. If, therefore, fecundation takes place early in the period of heat, the sex of the embryo will be female. If later it will be male.

The period of heat, or generative period (as Thuny calls it), here spoken of, must not be confounded with the *season* of heat, or rutting season. All farmers are aware that during the season of heat there are regular *periods of exacerbation*, which in the case of the cow, occur about every two weeks. These are the generative periods spoken of by M. Thuny. They are really menstrual periods, and, if attentively observed, are found to be always attended with slight menstrual discharges. Now, if M. Thuny is right, fecundation at the commencement of the menstrual period will produce females, and later, will produce males. He does not indicate the exact turning point.

Anxious to subject his theory to the test of disinterested experiments, M. Thuny gave minute directions to M. Cornaz, an intelligent Swiss stock-raiser, and son of the President of the Swiss Agricultural Society. These directions were followed in twenty-nine cases, and in every case, without exception, the desired sex was produced. First, in order to propagate the breed of a very fine Durham bull, M. Cornaz wished to get heifers; he made twenty-two experiments and got heifers every time. He then wished to get a few bulls of half breeds to sell to his neighbors; he made seven experiments and got bulls every time.

In the case of multiparous mammalia and birds, the test is much more difficult, and the results contradictory. M. Thuny's observations lead him to think that in the domestic hen "the last eggs laid are the cocks of the clutch." He accounts for this by supposing that in each generative period several ova commence to operate together, but are separated from the ovary successively, and therefore at the moment of fecundation (which takes place in the oviduct), the last separated are the most mature. M. M. Coste and Gebre on the contrary, find that when several ova are fecundated by *one* copulative act, the first laid eggs produce cocks and the last hens. These results are in accordance with certain observations which are as old as Aristotle. This great naturalist observed that pigeons laid but two eggs, one of which produced a male, and the other a female. The celebrated physiologist, Flourens, confirmed these results of Aristotle, and in addition proved that the egg first produced the male, and the other the female. These observations of Coste and Gerbe, and of Flourens and Aristotle, certainly seem to contradict the theory of M. Thuny on hens; but that may be accounted for on his theory, by supposing that during a single generative period, several

ova commence to develope successively, and separate successively at the same stage of development, and continue their development in the oviduct previous to fecundation. Being thus regularly arranged in the oviduct in the order of their ages, and therefore of their maturity. If all are fecundated by one copulative act, the most mature, or the males would be laid first. Embryologists must settle the important questions we have started. If definitely settled, then it would seem that experiments on hens were best adapted to test M. Thuny's theory; but until definitely settled, experiments on multiparous animals will avail little. In the meantime the experiments of M. Cornaz on cattle have never been controverted.

Such is a brief extract of the memoir of M. Thuny, and of the experiments of M. M. Coste and Gerbre, intermingled, however, with some explanations of our own, in order to make the whole more intelligible. We would like to see the subject taken up by some of our intelligent stock-raisers.

The great importance of the theory, if true, both in a scientific and practical point of view—both to the physiologist and farmer, can not be doubted. But the history of the theory can only be accomplised by intelligent and very careful observers. The physical signs of the generative period differ in the different species, and in different individuals of the same species, particularly in domestic animals. It is always well marked in wild animals, but in domestic animals it is often obscure. Close and patient observations will, however, overcome all these difficulties. *Nashville Journal Med. and Surg.*

On Dislocation at the Shoulder-joint. By Dr. G. HAMILTON, Falkirk.

[The difficulty in reducing a dislocated shoulder is frequently that it is impossible to fix the scapula whilst extension is made. Many plans have been recommended and tried, such as putting the arm through a common ladder, putting a transverse bar in the axilla, and placing the patient in a high-backed chair, with his arm extended over the back.]

About two years since, I met with rather a difficult case, in the person of a large-bodied and very muscular man, in which I took advantage of a huge arm-chair, with a strong high back, which I found in the house. On this I placed a pillow, for the axilla to rest upon, and with the assistance of two strong men I reduced the dislocation very satisfactorily. Another followed, shortly afterward, where I had no suitable arm-chair, but where I found a common screen for drying clothes, and this, with the pillow, also did very well. In a third case, neither of these being at hand, I mounted the patient on a table, placed the axilla on a pillow on the top of a door, and succeeded equally well. About six months since I had, unfortunately, to make personal acquaintance with this accident. In passing over a railway bridge, my horse took fright at a passing train, and came down with me. In stretching out my right arm to save myself, dislocation at the shoulder took place, of which I was immediately made aware by the ugly tearing sensation that occurred. Fortunately, a house was near at hand, in which I received shelter. Without losing a moment, I looked about for some suitable apparatus with which to effect reduction. Finding nothing better, I got a narrow table, on which I placed, on its side, a long narrow stool, such as is found in cottars' houses. On the top of this I had a pillow placed, on which I rested my axilla, my body being

placed between the two feet of the stool. Two strong men, who were at hand, kindly lending their assistance, reduction was effected after a few minutes' traction. I was so much pleased with the results in these instances, that I was thinking of having constructed a suitable apparatus which I could keep by me for use in such dislocations, when I cast my eyes upon a set of painter's steps, which immediately struck me as precisely the article I wanted. I have used this now in three cases, and its use seems to me to give very considerable advantages over the modes of reduction generally employed.

The "steps" I use are four feet ten inches high, and the moveable support should be fixed with an iron rod, and not with a rope, as is often the case, as the former secures a greater amount of steadiness. A pillow is laid across the top step, and the patient ascends as high as may be convenient, of course placing the axilla on the top of the pillow. One or two assistants now lay hold of the arm, drawing, at first, steadily outward and slightly downward, traction in the latter direction being gradually and cautiously increased by approximating the arm to the steps. Reduction in all the cases I have had has been effected easily, and even, if I may use the expression, elegantly, but none of the dislocations had remained unreduced for more than twenty-four hours. The great power that we here possess, however, seems to me to render it highly probable that, in cases of longer standing, this simple apparatus will also be found very efficacious.

The three agencies mainly to be relied on in ordinary cases of shoulder-joint dislocation are evidently extension, counter-extension, and leverage, and especially the combination of these. When the dislocation has remained long enough unreduced for adhesions to form, perhaps, also, the putting in practice preliminarily some such

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manœuvre as Sir Astley Cooper saw the Lancashire bone-setters use, where they rapidly whirled around the arm before attempting reduction, may be of importance to the operator.

In using the "steps," their height is very convenient for exercising extension, while the counter-extension required is made to a great extent by the weight of the patient's body, the rest being easily supplied by the foot of an assistant. The height, again, is very important in exercising leverage power, and its amount at command is enormous, and of course requires caution in its use. In laying hold of the arm of a person placed in a position for experiment, I have the feeling that I could with ease, if I wished, produce either dislocation or fracture of the humerus. Here, also, the combination of these powers is easy and natural, simply by causing the assistants to approximate the arm to the steps. Almost all our best surgeons have dwelt upon the importance of employing leverage in these cases, and yet the usual modes of reduction supply this very inefficiently. The heel in the axilla, or the knee of an assistant, gives us but little; while, when the pulley is employed, leverage power, from the points of extension and counter-extension being fixed, is lost altogether. To remedy this, I recollect seeing Mr. Liston, as he recommends in his "Operative Surgery," endeavor, with a towel under the patient's arm, to *lift up* the head of the humerus; but the power given by this means is evidently very slight compared with such leverage as can be got in using the "steps." With these, even should the pulley be used, leverage could easily be combined with extension, by gently moving the steps forward; or, perhaps, this might be done more effectually and continuously by having wheels attached to the steps.

In brief, this modification of the usual modes of reduction of these dislocations, which I have proposed, seems to possess the advantages—

1st. Of enabling the surgeon to dispense with his personal exertions.

2d. It gives an amount of power in extension and leverage limited only by a considerable of the resistance possessed by the tissues; and it also enables the operator easily and naturally to combine these powers.

3d. The position of the patient gives perfect freedom for the administration of anæsthetics, if such should be wished or required.—*Edinburgh Medical Journal, Sept.*, 1866, *p.* 248.

On a New Method by which Malignant Tumors may be Removed with little Pain or Constitutional Disturbance. By Dr. W. H. BROADBENT, London.

The attention of the author was directed to the treatment of cancer under the following circumstances: In 1864 he was consulted by a lady suffering from cancer of the breast. By his advice the breast was removed by Mr. Walter Coulson. The disease returned, and was again removed in August, 1865. In May of the present year, a tumor was growing more rapidly than ever near the cicatrices of the former operations. It was decided that no further removal was advisable; and, unless something could be done, a miserable fate was before the patient. The hypodermic syringe is now in the hands of every physician; and it seemed to the author that by it some fluid might be injected into the tumor which might so far alter its structure and modify its nutrition that its growth might be retarded or arrested. After considering the various substances which presented themselves to his notice, he selected acetic acid, for the following reasons: 1. This acid does not coagulate albumen, and might, therefore, be expected to diffuse itself through the tumor; and the effects would not be localized at the point injected.

2. If it entered the circulation it could do no harm in any way. 3. Acetic acid rapidly dissolves the walls and modifies the nuclei of cells on the microscopic slide, and might be expected to do this when the cells were *in situ*. 4. It had been applied with advantage to common ulcerations.

On May 18 the first injection was practised. The tumor was of about the size of a small egg, and a patch of skin of about the size of a shilling had become adherent to it. The needle was introduced through sound skin an inch or more from the part involved in the disease, and passed to the centre of the mass. About thirty minims of dilute acid (one part of acid to one and a half or two of water) were injected. It gave little or no pain. Next morning a bulla containing dark bloody fluid was found to occupy the patch of adherent skin.

May 23. This portion of the skin dry, hard, and horny; the adjacent part of the tumor not so hard. Again injected.

The patient, residing in the country, was not again seen till June 7, when the piece of skin mentioned was found detached from the surrounding sound skin; and a probe could be passed in all directions to a distance of three-quarters of an inch or more between the tumor and the healthy structures. A little discharge issued from the fissure mentioned. Injected on this date, and again on the 9th, the acid used being little stronger. It gave a little pain, and swelling and tension of the parts around followed.

On June 13, a few days afterward, there was a free discharge of fluid and solid portions, with relief of the swelling, etc. No fœtor whatever attended this discharge, which afterward diminished greatly.

Seen again on June 26, when, on external examination, the tumor was found to be much smaller; and, on passing

a probe into the opening, it entered a large cavity extending on all sides. Part of the walls seemed free from malignant structure, but at several points a crust of cancerous deposit remained. On attempting to inject, it was found too thin to retain the fluid, which either entered the tissues and gave great pain, or made its way into the cavity. The cavity was stuffed with lint saturated with dilute acid, and the case left in the care of the family medical attendant, who was to inject as he saw opportunity.

July 13. No impression made on the remaining disease, which had, in the opinion of the medical man, extended somewhat. Carbolic acid was tried for a few days as an application, but discontinued, and the cavity dressed daily with strong acetic acid by the medical attendant, and injections practised daily. This energetic treatment gave much pain, and excited inflammation all around.

When again seen by the author on August 4, there had been considerable hemorrhage, which had been arrested by free application of tincture of sesquichloride of iron. The result, however, was apparently the entire removal of the remains of malignant disease; and when last seen, a healthy granulating surface was left at every point.

Three other cases were related by the author. The author further formulated certain conclusions from the experiments detailed, and stated the cases to which, in his opinion, the treatment was not applicable. Guided by his experience, he considered large quantities of dilute acid preferable to stronger acid; and he would not, without great hesitation, attempt the destruction of any tumor which had not involved the skin. His aim had originally been, as stated in the early part of the paper, not necrosis of malignant tumors, but a modification in their nutrition. The theoretical grounds for this hope were, that

cancer owed its malignancy to its cellular (to use a nomenclature now almost antiquated) or fœtal structure; and that in acetic acid we had an agent which might be expected to diffuse itself through the tumor and reach the cells, and, having reached them, to effect changes in their structure, and affect them vitally, while it could scarcely do harm. The results he had brought before the profession at the earliest possible moment. The ultimate value of the treatment he left to be decided by a more extended experience. It was important to use large quantities of dilute acid, and not to have the acid too strong.—*Medical Times and Gazette, Sept.* 1, 1866, *p.* 229.

Rapid Cure of Cynanche Trachealis and Membranous Croup, by means of insufflation of pulverised Nitrate of Silver. By DR. GUILLON.

Cynanche trachealis and membranous croup carrying off new victims every day, I think it my duty to call attention to a treatment by means of which that disease is very promptly cured, even when the false membranes have extended to the larynx. This treatment, the advantage of which has been demonstrated to me by long experience, consists in the insufflation of a very fine powder of nitrate of silver on the diphtheritic membranes and the surrounding parts. Were this treatment more generally known, it would in many cases have done away with the operation of tracheotomy, which is performed with success only when the disease does not extend beyond the larynx.

For the first time, in 1828, I had recourse to insufflations of nitrate of silver with two patients suffering from cynanche trachealis; after having ascertained that alum was powerless to prevent the spread of the disease, and that cauterization with a sponge dipped in hydrochloric

acid could not reach the false membranes behind the pillars of the palate, above it and in the larynx.

Experience having taught me, at a later period, that nitrate of silver in solid pieces left in the mouth a taste more disagreeable than when it was pulverized, I adopted the powder, and have used it pure, well pulverized, and perfectly dry. Should it be in any way damp, it can be easily dried by holding it in a silver spoon over a candle or hot coals. The only point of importance with regard to the instrument, is to observe that the powder on leaving the tube is spread all round, and not projected in a lump covering only one place.

The advantages which I have invariably obtained from that treatment, make it a duty on my part to call to it the attention of my *confrères:* 1st. Because the use of nitrate of silver, finely pulverized and carried by insufflation on the diphtheretic membranes and surrounding parts, cures the disease very quickly, when it begins by the mouth and larynx. 2d. Because I am convinced that a good many persons who have died of cynanche trachealis (*angine pseudo-membraneuse*), the march of which has been impeded neither by cauterizations with liquid caustics nor other known remedies, would have been very promptly cured, had the insufflations of pulverized nitrate of silver been used. 3d. Because the projection of that substance on the false membranes behind the pillars of the palate, on the palate itself, and in the larynx, causes their quick expulsion. 4th. Because the styptic action of that salt on the mucous membrane prevents the disease from spreading to the nasal fossæ and larynx, and from bringing on membranous croup and membranous coryza. 5th. Because the astriction produced by the expulsion of the false membranes, spares the patient the intoxication, the diphtheritic poisoning, resulting from absorption, when the disease is not checked in its course. 6th.

Because, cynanche trachealis being a local disease when it begins, this local medication, with a suitable regimen, ought to be preferred to emetics, purgatives, etc., prescribed by some physicians to destroy what they call the specific morbid element.

It must also be used in preference to the substitutive medication, recommended by Dr. Trideau, which does not prevent diphtheritis from extending from the pharynx to the trachea, and from constituting a croup which soon becomes fatal. Hear what he says (page 11 of his book): "The croup which follows cynanche trachealis, we must admit, will almost invariably resist all sorts of treatment."

I must here observe that, had this treatment been more general, we should not have seen so often those cases of paralysis brought on by diphtheritic poisoning, which happen in the course of that disease—paralysis of the æsophagus, which compels the use of stomach tubes for the introduction of food, as also those cases of sudden death resulting from paralysis of the respiratory organs.

As the insufflations are performed in two or three seconds, and the pain produced by the nitrate of silver is only felt later, if the patient presented any symptoms of incipient croup, the first insufflations should be made when he takes a deep inspiration, so that the powder may reach the larynx and stop the croup in its beginning, before the pain is developed.

As the diphtheritic membranes are sometimes formed again, I use astringent gargles, and should these fail, I have recourse to a new insufflation of nitrate of silver.

In 1858, Mr. B. and his son were both attacked with cynanche trachealis. The insufflation in Mr. B.'s mouth was performed in presence of Mr. Bretonneau; that on the son, in presence of Mr. Blache. Two insufflations in each case were sufficient to insure complete success. Another cure was obtained on a patient of Dr. Delpech,

a young Belgian princess, suffering from cynanche trachealis covering the whole palate and pharynx, with violent fever and engorgement of the submaxillary glands and cervical ganglions. Several cauterizations with hydrochloric acid having obtained no result, two insufflations of nitrate of silver were performed at two days' interval, and were perfectly successful. The first insufflation was done at four o'clock in the afternoon; and at our visit the next day, the mouth and pharynx were found entirely free of diphtheritic exudations, and fever had ceased. Two days afterward, and notwithstanding the use of alum gargles, new membranes were formed; when a third and very light insufflation was performed, and this time the cure was complete. Several other examples might be cited, but these we consider as sufficient.

Wishing to know how far the nitrate of silver penetrated into the aërial tubes, we made (Mr. Trousseau and myself) two insufflations to an average-sized dog. On examination, we found the powder had reached the end of the second divisions of the bronchi.

Since, by insufflation, the powder can be carried as far as the second divisions of the bronchial tubes, it can be practiced with advantage to blow powder into the larynx and trachea, in cases of incipient membranous croup; that is to say, in circumstances where tracheotomy is tried with some chance of success, but often with an unfavorable result. Since this local treatment, used early in diphtheritis when it begins with the mouth, has obtained results which can not be reached by applications of liquid caustics, insufflations of alum or tannin, the use of chlorate of potassa, of bromide or iodide of potassium, mercurials, emetics, purgatives, balsams, etc., it seems to us that this local treatment ought to receive the preference over all others.—*Revue de Thérapeutique.*

Dressing of New Born Infants. By W. B. FLETCHER, M. D., Indianapolis.

If there be one custom of time-honored folly, which we have continued to this day in the "lying-in-chamber," it is that absurd and cruel system of the first dressing. There is no reason for quoting from the most ancient authors to find absurdity upon this point, when our most recent text-books and lecturers give almost the same directions. But even if they did not, how many physicians ever personally attend to this important point, whereby the comfort of the child and mother are all at stake. In most cases, as soon as the child is born and the cord divided, it is tied and the baby given to an employed nurse, some wise neighbor or friend. The question of "What will she do with it" may best be solved by watching her. First she huddles it up in an old shawl or other garment. She is careful to cover its head, as though it were a young puppy she would smother; or rid the world of an infant cat. In a few moments, some one brings water, soap, and towels, and also a heap of old linen, and a trunk full of new. The good woman now turns to the blazing fire, or the hot stove, that the baby may not take cold, and while the youngster implores with yells and cries, she bakes its tender skin on one side while she dabbles its head, eyes, mouth, and body with a vile solution of frequently very bad soap. After this ceremony has been past (it matters not whether the child be cleaner than before) she turns her attention to the cord, upon which she frequently deposits, slyly, some pestiferous saliva, "Its healin'," she says, and now she follows authority. 1st. She cuts or burns a hole in the centre of a bit of cloth, through which she draws the cord; 2d. She places a rag upon

this; 3d. A rag upon that; and 4th. She puts on a "binder." Now it is upon this operation she prides herself, if she be a hireling, that is the closeness and compactness with which she can pin the binder round the expanding body of the infant; 5th. She puts on a little garment, called a shirt, which is in fact without body, neck, or sleeves, as far as protection goes; 6th. She puts on the "square" with more pins; 7th. She pins on a "waist" with a long skirt; 8th. Another waist with a long skirt; 9th. A dress. And now the baby is presentable. The doctor sees it's all right, and goes home. He hears not within an hour the stifled screams of compressed lungs, that with every breath are expanding the chest, and the nurse wisely says it appears "colicky," for which it must be drenched with some damned decoction of catnip, sling, brandy, laudanum, water, and molasses, etc.

The next visit the nurse swears it's a good child, only a little "colicky," but she can cure that, and away the doctor goes, where he can not hear the little one cry, and see it dosed for screaming on account of the "cord" having become a half putrid, half drying mass, glued and ulcerating to the tender belly.

This picture may be overdrawn for some cases, or for some countries (if there be any), where professional nurses are selected for their intelligence, and not from the most "vulgar ignorant." One thing I am sure of, and that is, upon carefully examining, you will find some of the above named outrages, if not all of them, in force at once.

In my experience, adopted in some sixty cases, I have found the following method of procedure give the most comfort to all hands, by giving the baby no excuse for those cries, which are hardly ever heard if an infant is not uncomfortable.

My baby is first quickly washed by oiling the hand and

rubbing the parts to which the secretions have adhered, and then with a soft cloth, soft water, and trace of castile soap, and frequently with warm water alone, the infant may be cleaned. Then I begin dressing. 1st. A bit of lint or linen, two inches square, is tied closely upon the end of the cord like a cap; 2d. The square, or diaper, of soft and old material, is put on loosely with a diaper pin; 3d. A fine warm flannel gown (like a woman's night dress), with long sleeves, and coming below the feet, is put on, and thus the baby is quickly and comfortably dressed, and placed in its mother's arms, where the temperature of her own body is food and strength for her new-born babe, until the milk is secreted.

Let any physician try this plan, and he will meet with opposition from every old lady in the land. "Why, doctor, its bowels will burst out when it cries, if you don't pin a binder on!" and a number of similar excuses, for not being directed by the physician. But the physician will be rewarded by finding the infants more clean, sleeping more, and eating more than when uncomfortably dressed, and I believe less liable to umbilical hernia and ulceration about the cord. I have known children rescued from apparent suffocation by simply unpinning a close binder.—*Cincinnati Lancet and Observer, July*, 1866.

Ulceration from Hypodermic Injections.

Dr. W. S. Mitchell reports the following case in the *Southern Journal of Medical Sciences:*

A male Swiss, aged twenty-three years, was admitted to the Charity Hospital, New Orleans, suffering from partial emprosthotonos, all the anterior muscles of the trunk being rigid in a semi-contracted condition, muscles of the arms and legs rigid, arms extended from the body, but flexed at the radio-humeral articulation; muscles of face slightly rigid, inability to articulate understandingly,

mind clear, tongue much furred, bowels very torpid; little if any acceleration of pulse or increase of heat of the body. In seeking for an exciting cause, a large irritable ulcer, the size of a Mexican silver dollar, was found to be located just above the insertion of the left deltoid muscle; the border of the ulcer almost a circle, clean cut; the areolar and adipose tissues beneath entirely destroyed, presenting to view the uncovered muscle, which had the appearance of a piece of partially roasted beef, cut across the fibres, conveying to the mind the idea of some corrosive action.

The symptoms gradually but rapidly increased in intensity, and the patient died. On inquiry, it was found that the patient had been treated two months previously in the same hospital for intermittent fever, by hypodermic injections of quinia, the injections having been practiced over the lower deltoid region of the left arm. Recovering from the fever, the patient was discharged, but in a few weeks again presented himself with the deep ulcer occupying the arm injected. Dr. Mitchell inclines to the belief that *quinine* is of itself a positive and powerful irritant, when introduced into the tissues by the hypodermic method; he has seen in several instances much pain, and considerable redness result from injections of small quantities of quinia, simply suspended in water, without any of the dissolving acids, and he is satisfied from hearsay, that this is not the only case of ulcer which has followed the hypodermic use of quinine in the city of New Orleans.

Searching for Bullets.

The *Lancet* contains an interesting record of observations in the military hospitals of Dresden, by Dr. Bruce, of University College, London. There was ample opportunity for observing the effects of the different bullets

employed by the three armies, and after a careful examination, Dr. Bruce says he can not agree with the generally-entertained opinion that the bullet of the Prussian needle-gun produces a less serious wound than that of the Austrian Minnie rifle. The Prussian soldiers fired at short ranges; the Austrians and Saxons at long ones. The doctor continues: The search after bullets and their extraction was a source of the greatest interest, both to surgeons and patients. It often proved a matter of the greatest difficulty to determine whether a bullet was lodged in the body or not; frequently the men would positively assert that the ball had been extracted on the field, when it subsequently proved not to have been the case. The excitement produced in some men by the sight of the bullet was most astonishing. An Italian seized his bullet, bit it violently, and cursed it so furiously that it had to be taken from him, to prevent him injuring himself. A Prussian soldier, apparently by no means an excitable fellow, on seeing the ball which had been removed from his thigh, burst into tears, and shaking hands with us all round, divided his attention between blessing us and cursing his bullet. The men always kept them as valuable relics, and would not have parted with them at any price. The "Garibaldi sonde," as it is called after the illustrious hero for whose sake M. Nelaton invented it, proved of the greatest service. I have known a bullet, buried at the depth of four inches in the fleshy part of the thigh, recognized by the faint streak of lead left on the unglazed porcelain at the end of the probe. By this aid it was easy to determine between a fracture-bone and a bullet. Of the instruments used for extraction, the ordinary bullet-screw and long forceps were perhaps the two most commonly employed; but the new American bullet-forceps was very highly spoken of. With regard to the apertures of entry and exit, there was, as a rule,

very little difference to be observed between them; they were often of the same size, and presented very much the same character. I frequently observed that the supposed aperture of exit healed more rapidly than the other. The account of the patient could rarely be trusted, and I found the holes in the clothing to be the best guides, as here the aperture of exit was invariably the larger and more regular of the two. In one case, where a bullet had penetrated both thighs, it was only by examining the trousers that we could determine the direction it had taken, the patient's account proving incorrect.—*Medical and Surgical Reporter.*

Non-Mercurial Treatment of Syphilis.

Mr. R. W. Dunn, in a pamphlet on the mercurial and non-mercurial treatment of syphilis, gives the results of experience of many authorities, as well as of his own; and from these draws the following deductions. 1. The primary sore can be healed without mercury. 2. Mercury does not prevent secondary symptoms. 3. The secondary symptoms that follow the non-mercurial are slighter than those that follow the mercurial treatment. 4. Secondaries are more frequent after the mercurial than after the non-mercurial treatment. 5. If the patient be of a strumous diathesis, mercury ought to be avoided. 6. Rupia and bone-disease seldom follow the non-mercurial treatment. 7. Perhaps the disease disappears more rapidly under the mercurial treatment, but the result is not effective or lasting; and by avoiding the use of the drug altogether, we do not damage the constitution, and nature, with a little help, will cure the disease. 8. In hereditary syphilis, the rate of mortality is lower, and the duration of treatment is shorter, when treated without mercury.—*Brit. Med. Journal.*

Medical Statistics.

Claude Bernard, in his *Introduction a l' Etude de la Medecine Experimentale*, just published, gives us his views as to the value of statistics in medicine. The opinions of such a man on such a subject will interest most of us.

There are (he says) political, social, and medical theorists, among whom statistics have a sort of mysterious veneration. Everything can be proved by statistics. It is a convenient way of getting rid of troublesome facts and of presenting hypotheses in an imposing form. Thus, when the number of pulsations are measured by an instrument throughout the day, and an average is taken of the varying numbers, "on aura precisement des nombres faux." The figures are exact, the average is an error, for it represents no actual condition. The pulse diminishes during the intervals of fasting, accelerates during digestion, and varies continually according to other influences, such as movement and repose; all these biological peculiarities disappear in the average. In like manner, when averages are struck from calculations respecting secretions, there is a mingling together of the most varying conditions; a secretion which is alkaline at one moment is acid at another; in the average it appears a compound of the two. When a physician collects a number of cases, and from them draws up a description which represents the symptoms on an average, he describes that which never existed in nature.

This error of averages is strikingly exhibited in the various theories of food propounded by physiologists. The amount of oxygen, or any other substance, consumed by an animal in one day is estimated and compared with the weight of the animal; but the weight represents a total of various substances with which the oxygen has very various relations, some of them being totally unaltered

by the oxygen, others profoundly affected by it. In like manner, a poison is estimated according to the amount required to kill an animal of a certain weight. "Il faudrait pour etre plus exact calculer non par kilo du sang et de l'élément sur lequel agit le poison." But even then the mere weight tells us little. Other conditions interfere, and these, which vary with the age, size, sex, state of digestion, etc., of the animal, determine the effect of the poison.

Obviously, the first condition of statistical comparison must be that the facts compared are exactly observed and are capable of being reduced to unities comparable with each other. How often is this condition present in medical statistics? Every one familiar with hospitals knows what numerous causes of error have vitiated the reported "cases." Very often the diseases have been named at hazard after a superficial diagnosis; and even when the cases have been carefully examined, no two precisely resemble each other; age, sex, temperament, the complication of other diseases, and a crowd of circumstances interfere; and if this is so with two cases, how much more will it be with a hundred? The average is supposed to eliminate all these differences; but whenever the physician has a case before him, that case is individual, not an average; its peculiarities are not eliminated, yet on its peculiarities must depend the effect of his treatment.

M. Bernard reminds us that it is only when the cause is quite undetermined that any one thinks of applying statistics. No one enumerates cases in which oxygen and hydrogen compose water; no one counts the number of times in which division of a nerve paralyzes its muscles. It is only when the cause is unknown that cases are counted, and then the enumeration throws no light on the conditions. For example: some experiments showed

that the anterior roots of the spinal nerves were insensible; other experiments showed that they were sensible; would it have thrown any light on this difficulty to say that the law of sensibility in the spinal roots is that of twenty-five per one hundred? Or ought we to invoke "la loi des grands nombres," and say that the roots are as often sensible as insensible? It would be absurd. There is obviously a reason why they are sensible, a reason why they are not, and it is these reasons we are to discover.

A great surgeon performs an operation many times; he then gives a tabular statement of the cases which have been fatal and the cases which have been successful, and statistically concludes that the mortality of this operation is two in five. What will this tell us respecting the certainty of the next case? We can not know whether it will be one of the two or one of the three. We ought to know what are the conditions which will range it infallibly under one or the other head. Instead of an idle enumeration, we should make a fruitful study of each special case, and discover, if possible, the cause which renders the operation fatal. The same reasoning applies to curative remedies. A certain remedy has in twenty instances been followed by a cure; in seven instances no cure has been effected. You will say, perhaps, that there is twenty to seven in favor of success. Not in the least. You do not know how many of those twenty patients would have recovered had there been another remedy tried, or no remedy at all; you do not know what was the precise action of the remedy, what changes it effected in the organism, what its effects will be on the organism now about to be submitted to it. As a great mathematician observed: "La loi des grands nombres est toujours vraie en général et fausse en particulier." And as to the "compensations which bring about the

law," they are useless in medicine. Mathematicians admit that if a red ball has come up fifty times in succession, that is no reason why the white should come up on the fifty-first; the white ball is certain to come up some time or other; but its appearance depends on specific conditions which have nothing to do with what has gone before.

Is there, then, no utility in statistics? M. Bernard is far from saying so. He admits that statistical results lead to probabilities and suggest research; but he protests against the idea that medicine must be only conjectural. He insists on the necessity for a scientific basis, and declares that every method of treatment which is not grounded on a clear recognition of the casual connections between agents and the organism is mere empiricism, not much removed from charlatanism.—*American Journal.*

White Paste which will Adhere to any Substance.

Make the following mixture: Sugar of lead, 720 grains; and alum, 720 grains; both are dissolved in water. Take two and a half ounces of gum arabic, and dissolve in two quarts of warm water. Mix in a dish one pound of wheat flour with the gum water cold, till pasty in consistence. Put the dish on the fire, and pour into it the mixture of alum and sugar of lead. Shake well, and take it off the fire when it shows signs of ebullition. Let the whole cool, and the paste is made. If the paste is too thick, add to it some gum water, till in proper consistence.—*Journal of Applied Chemistry.*

EDITORIAL AND MISCELLANEOUS.

THE MEDICAL ASSOCIATION OF GEORGIA.

The approaching session of this body will be held at Griffin, on Wednesday, 12th April, and its importance suggests the appropriation of our editorial space to its consideration. The members of this association, in referring to its past meetings, instinctively recall the paucity of members in attendance, and, notwithstanding its high functions, the little interest manifested by physicians at large. A few who were ardently devoted to the advancement of science, and ambitious to place the society above a mere nominal, formal gathering of physicians, sought to make it a true exponent of the scientific labors of the profession of the State. Through their agency many valuable papers have emanated from it from time to time —contributions of intrinsic value to the scientific, and of practical avail to practitioners. The pages of this journal (its official organ) for the last twenty years are rich in practical articles and essays upon the different branches of medicine, which, in the aggregate, constitute a volume of great value—one, indeed, worthy of addition to any medical library. In this is exemplified a fact that we have seen elsewhere stated, namely, that medical journals can no longer be regarded as mere "*finger-posts*," but as true exponents and representatives of the science in its progress to perfection and exactness. The announcement of a discovery or the new interpretation of an old accepted idea is made and diffused through this medium, and long in advance of the more stable works upon the subject, the verdict of the profession is returned. So that a diffusion of knowledge is obtained which could not

be so speedily and thoroughly done by any other means. A practical familiarity with the literature of the medical press is, therefore, one of the most profitable resources of the physician, and, indeed, may be taken as a test of his acquaintance with the present state of the science. Journalism instils its information silently and satisfactorily, a fact which will receive its due weight from those of our readers who have complacently watched and now recognize the great change which at present constitutes medicine a *temple of conservatism* instead of a school of "excessive medication."

But, not to digress further, the next session of the State Society we believe to be the most important since its organization. Its re-organization finds the profession in a far different condition from that of the past, and it should not be left to the direction of a few. The modest practitioner must not consign his interest to ambitious scientific aspirants, but all must move in concert for a common interest. At the time of its foundation we were in an independent position, one, indeed, which warranted the absorption by the purely scientific of all other interests; but the business interests, at least for the time-being, must receive equal attention. Emancipation has *robbed us of the* basis of that independence; and, until the latter is, *by some means* restored, the profession must remain crippled in resources, and shorn of their strength. Heretofore it has been regarded as mercenary to intimate pecuniary matters in connection with medicine, these, by common consent, being generously absorbed in the benevolence and nobler aspects of the calling, but the time has come when the instinct of self-preservation compels their consideration. Spoliation has deprived us of our resources, and however modest or delicate, physicians must no longer disregard their long-neglected business affairs. One way to foster them is through the State Association,

where, after conference and discussion, a concerted movement may be inaugurated to relieve the present dependence and restore lost influence. It is to further this object that, at our solicitation, the article upon the "Legal Status of the Profession" has been prepared. Many, doubtless, will be astonished at the exposition, and receive the first intimation of the fact that they not only have no legal rights, but by practicing for "fee or reward," without a license, are openly violating one of the statutes of the State, thereby incurring the double risk of a loss of their earnings and of a criminal prosecution, the penalty of which is fine and imprisonment. As stated in the article referred to, all physicians of the rational school of medicine not in practice on 1st January, 1863, under a *legal diploma*, are debarred by law from the collection of claims, and while those who have been thus engaged between the adoption of the Code (1862) and March 6th, 1866, are relieved from the *penalties* of the offence against the law, yet they are equally powerless to enforce payment. The possession of a diploma confers no right to practice for fee or reward within the limits of this State, unless the possessor be a graduate of a Medical College having the right in its charter to invest its graduates with all the rights and privileges of a *licentiate under the law.* All of the Colleges are not clothed with this authority, and, as a public journalist, it is our duty to apprise the profession of the fact. Of the graduates of last year, only those of the Medical College of Georgia, now or since practicing in the State, *without a license* from the Medical Board legally established, are authorized so to do. Where the charter does not give the vested right, a license from an Examining Board, which does not really exist, is, in the terms of the law, necessary to prevent prosecution, and indispensable to the collection of debts. Physicians coming into the State are

not protected by their diplomas—an intermediate step is required, namely, a license which must be secured and duly recorded.

It may be objected that such a law is a "dead letter:" it may be so far as a prosecution is concerned, but, in the case of a *suit*, it is all-sufficient. It can not be set aside or rendered inoperative by judge or jury.

In this respect the quack has the advantage over the regular practitioner; the Legislature has placed a premium upon Homœopathy, Hydropathy, Dutch and Indian Doctors, "Dr. Durham's Urine or Water System,"* *et id omne genus*, by waiving the necessity for additional license, not, we flatter ourselves, because they thought the rational school less honorable, but upon the principle that the greater license these pretensions had the sooner they would explode.

It is useless to pursue the subject further. Suffice it to say, that all physicians not in practice on the 1st of January, 1863, who may have come into the State or graduated at any College not possessing the vested right adverted to, and now practicing, require a license as an indispensable pre-requisite to their lawful action. The licensing Board of Physicians exists in law, but not in fact. This state of affairs should no longer exist: either abolish the law or vitalize the board.

Apothecaries are even more seriously affected than physicians, and as many of the latter are also engaged in this capacity, we give the law upon the subject. A diploma does not clothe the graduate with the right to sell drugs (beyond the dispensing of them in the pursuit of his practice) without a license from the Examining Board.

* In 1854 a special act was passed amendatory of an enactment in 1852, authorizing one Wm. C. Dabbs, of Floyd County, to practice "Dr. Durham's Urine or Water System," in lieu of the "Homœopathic System," a fit substitute, doubtless, each for the other, in the minds of the legislators.

When he becomes an apothecary he must comply with the law as determined for that class of merchants.

The act of 1825 required apothecaries to obtain a license from the Medical Board, and section 1,351 of the Code (adopted 1862) as amended by the act of 1866, reads:

"No person in this State shall open or keep an apothecary store without first obtaining a license therefor from the Medical Board of his own school."

Section 1352. "Any person violating the preceding section is liable to indictment, and, on conviction, to be fined not less than one thousand and not more than five thousand dollars, and for continuing after conviction to the like fine and imprisonment not exceeding six months. The onus of proof is upon the defendant to show his authority."

Section 1353. "Druggists are exempt from obtaining said license, who were engaged in said business prior to 24th December, 1847, and who continue so at the adoption of this Code; and merchants and shop-keepers may deal in medicines already prepared, if patented, or if not patented are legally warranted by a licensed druggist."

Prominent among the business interests to be canvassed is that of the relation of physicians to plantation practice. Formerly it was an individual matter of the planter, or owner of slaves, but now it is a collective interest, in which at least three parties are concerned—the freedman, contractor, and physician. It is plain that the *contract* system is the only one now practicable for general purposes, and it behooves the profession to adopt some uniform scale of charges which will secure general support. If the physicians of each neighborhood are left to such desultory plans as each may see proper to adopt, the result will be continued dissatisfaction to all parties. If a uniform system prevails, each county will soon be mapped out into practicing districts included in a radius of five or eight miles, thereby securing a fair distribution of the

labor and gain, and equalizing incomes. We have been in communication with physicians in different parts of the State, and find a general testimony borne to the value and practicability of the contract system, the terms being fixed by the *distance* and *number* of laborers. We would suggest to our country brethren, who are most interested, the propriety of holding meetings for the discussion of the matter, and the appointment of delegates to the Association, who may come prepared to represent their views and mature a plan of operation. Not being members of the Society already, need not deter them, for all of good repute will be welcomed to an immediate and full connection, and to a participation in its deliberations.

At the last session the following resolution was adopted:

"*Resolved*, That the permanent location of the Association at some suitable place, in the opinion of this meeting, is called for by the highest interests; and that, in view of said interests, we do invite and call upon its members, in every portion of the State, to meet with us at our next annual meeting, and settle definitely this question."

We recall it only to condemn it. We can not perceive how its highest interests require its location. If this is done its organization must likewise become permanent—a condition which will soon place it under the control of local influences. Its members are diffused over the whole area of the State, and each section in turn should be favored with its sessions. In imitation of the practice of other State associations, let it continue to alternate the places of its meeting; this will do more to increase its members and bring them into pleasant association, than any other course. Commending the subject to the earnest consideration of the profession, we dismiss it, with the hope that the approaching session may prove fruitful of good to all their interests. W. H. D.

IS A CRYING BABE NECESSARILY COLICKY?

Nothing is more common than the belief that when an infant cries it must have the colic, and that it should be treated accordingly. Now, can it be true that infants never cry unless they suffer pain, and that colic is the most common cause of this pain? Have we not, on the contrary, every reason to believe that the cry of the infant is merely a substitute for language, and is therefore used to make known to the mother or nurse such simple wants as may be experienced by one so young? While it would seem probable that an infant who suffers no pain, and who is sufficiently supplied with its natural food, can have no cause to cry, such is not always strictly the case. There is a great difference in the temper and disposition of infants; some being naturally irritable, cross or peevish, and others good-natured and cheerful. All nurses understand the difference between a good and a bad child; and it would be interesting to take note of these early indices, for the purpose of ascertaining whether or no they may be relied upon as the premonitions of subsequent developments in the adult. Some infants will remain quiet until a sense of hunger or thirst impels them to cry out; while others will cry to be turned over, or to be taken in the arms, or even to be walked about; and if these caprices are indulged, the child soon becomes so "spoiled" that its nurse will have no rest. It is surprising how soon the infant learns by experience what he may exact by his cries; and, although born good-tempered, he may become extremely troublesome if too much indulged. Some of them only a week old will keep the nurse all the time busy, merely because they were not at first allowed to cry at all, without being handled.

It can not be denied that peevishness is, alike in infants

and adults, very often consequent upon the discomfort of bad health; and it is important that the cries occasioned by this state of things be distinguished from those induced by actual pain. A judicious mother or nurse can not fail to discover the difference by a little careful observation, and it should be the duty of the medical adviser to assist in this diagnosis; for until the real cause of the cries be ascertained, there can be no rational medication. The cries of an infant are in reality only symptoms of the mental or physical condition of the child. It is our business to give to them their proper interpretation. The child cries! Is it caprice; is it hunger; is it discomfort; or is it positive pain? These are the questions to be solved before we should resort to medication, if we wish to be consistent with philosophy, or even with ordinary common sense. And yet, how often do we not find infants dosed with "*colic drops*" whenever they cry!

Most of the nostrums vended as "colic drops" contain opium in some form or other, and some aromatic or carminative. These "drops" are therefore primarily narcotic and stimulant, and secondarily constipating; so that, although they may compose or put the child to sleep, whether the cries proceed from colic or not, their use, or rather their abuse, is objectionable. Again, how are we to determine that the child has colic? Pain in the bowels may depend upon spasmodic contractions of their muscles induced by indigestion, or irritation of some kind; or it may be occasioned by mere flatulency. While the spasmodic pains usually precede or attend looseness of the bowels, such need not be the case with the presence of flatulency. The former pains come on in paroxysms more or less severe, which subside very soon, and leave the patient entirely relieved until they return again. Flatulent colic is more persistent, never so intense, and may be usually recognized by the hollow sound produced by

percussion of the abdomen, especially if this circumstance be taken in connection with the other points in the history of the case.

The diagnosis of infantile diseases is by no means so difficult as is generally imagined. In the affection before us, it is just as easily made out for a child as for an adult. If the physician knows his business, and will use with due diligence the resources of art, he will rarely fail to establish the diagnosis satisfactorily.

If the bowels are regular and the evacuations in a natural state, while the abdomen yields a natural sound upon percussion, has a natural feel to the hand, is not distended nor knotted by spasmodic contractions, is not painful when pressed upon, we may very safely conclude that the child can not have colic.

Have we any good grounds to believe that colic is often almost habitual in infants too young to speak and who can only cry, whereas it is only an accidental or occasional disease in those who can speak and in adults? Such a violation of analogy ought not to be admitted to exist without much more evidence than can be adduced in favor of it.

Ear-ache is very common with children, and may either make them peevish or cause them to cry violently and protractedly. This affection can always be detected by pressing a finger just below or in front of the ear, by which the pain will be much increased and the child will renew his cries. As there is usually but one ear affected at the time, the experiment must be tried on both sides. If the pain be purely neuralgic or nervous, it may be relieved by almost any warm application; but if it be occasioned by the formation of an abscess about to break in the ear (in which case we may usually detect a little fulness or hardness in the angle just below the ear, or in the slight depression just in front of the orifice of the

ear), these remedies are very apt to fail, and we have to resort to a little Laudanum taken internally, or dropped into the ear in combination with a few drops of oil.

Closely connected with the treatment of the so-called colic is the common practice of

Jolting Infants.

If the child be really suffering with colic, it would be as absurd to expect to relieve it by such violent shaking and jolting, as it is to suppose that there is any efficacy in the veterinary practice of making a colicky horse trot up and down the road, until almost exhausted. But if the poor child happens to have pain in the ear or headache, both of which are very common, the cruelty of violent rocking, shaking in the arms, and jostling upon the knees, with the loud singing and jargon of the nurse, must be apparent. The treatment of Sancho Panza by the maid of the enchanted castle was trifling in comparison with this.

The affectionate and tender-hearted mother can not bear to remain quiet while her babe is screaming, and she freely exerts her lungs and limbs to the uttermost in the hope of giving relief. It is a natural and a laudable feeling which prompts her, and the exertion relieves *her* nervous system by working off the nerve force which would have been otherwise concentrated in the brain. It therefore requires some philosophy, that which emanates from enlightened reason, to examine quietly for the true cause of the child's cries, and to administer the proper remedy. If no medicine be necessary, the child will, if laid comfortably on his bed or held quietly in the mother's lap, very generally go to sleep after crying a little while. It can certainly not go to sleep so long as it is not allowed to be at rest.

Do Children bear Disease better than Adults?

To suppose that children can bear disease better than adults, is to admit that the weak have more powers of resistance than the strong; that an unfinished fortification is better adapted to resist attacks than one already completed. And yet, we continually hear persons manifesting a desire that their children might take the measles, hooping-cough, etc., while young, so as to be rid of subsequent danger! This is a radical error. Children should be kept from sickness as long as possible, for no one can predict the result of what might at first seem to be the most trivial affection.

Common sense should lead us to avoid sickness at all times, and at any age. If we carefully keep our children from visiting houses in which there is any sickness, and remove them from districts affected with epidemics; if, in short, we use due diligence in avoiding all known causes of sickness, we shall have nothing to reproach ourselves, when, notwithstanding such precautionary measures, they are overtaken by disease. The very fact that children are more prone to sickness than others, should incite parents to great watchfulness in regard to their hygienic condition, their cleanliness, their clothing, their food, their exercise, their supply of fresh air, insolation, etc., etc.

The best evidence that children do not bear sickness as well as adults, is to be found in our mortuary statistics, which reveal a frightful loss of life among infants and children. This is equally true with regard to the lower animals and plants. The more tender the plant the more feeble are its powers of resistance, and the more liable it is to disease.

L. A. D.

Clinical Observations on Functional Nervous Disorders. By C. HANDFIELD JONES, F.R.S. Philadelphia: Henry C. Lea, 1867.

The American public has already been made familiar with this work through the *Medical News and Library*, but many of the profession will see with pleasure its reappearance, in its present neat and convenient form.

A work which would represent, in a practical manner, the influence which the recent important and highly interesting researches into the physiology and pathology of the nervous system have exercised, in that most obscure of all the chapters of medical science, the functional neuroses, is just now much needed, and would fill a sensible gap in our medical literature. We can not say that this has been done in the work before us, but the busy practitioner will, we think, glean more practical points from the perusal of this little volume than from more compendious treatises. It is an advantage of the form of clinical notes, which our author has given to this book, that it enables him to dispense with systematic descriptions and details familiar to every one, while it allows him to dwell with greater stress upon new and important facts.

No systematic arrangement is attempted. The different parts of the mechanism are taken up in their natural anatomical order. The work opens with a chapter on General Pathology, in which the author develops the basis of his peculiar views on neuro-pathology. It is to be regretted that this particular part is not more full and explicit, as many readers will be unfamiliar with the recent extraordinary advances in neuro-physiology. In this chapter much attention is justly paid to the interesting and highly important discoveries relating to inhibitory and vaso-motor action. We can not coincide with the

views of the author on either of these subjects. His idea that inhibitory action is purely pathological, and produced by defect, or excess of power in any nerve, seems to us directly refuted, by its undoubted existence as an automatic regulator of cardiac action. Section of the vagi could only accelerate the movements of the heart by the removal of a normal inhibitory influence on the centre of its rhythmical action. On the whole subject of animal heat, and the beautiful part taken by the nerves of the heart, and blood-vessels in its regulation, his notions seem to be exceedingly crude. Had he understood this subject better, he would have spared himself and his readers the curious theory of an alternation in the action of the ordinary motor, and the vaso-motor nerves. This is one of those awful explanatory hypotheses that used to impress us so wonderfully in the old days, when expounded "ex cathedra," but which we find somewhat indigestible now. In spite of all this, the numerous instances scattered through the book, in which the influence of vaso-motor action in the production of the most varied forms of disease is demonstrated, constitute, we think, the greatest merit of the work.

The Southern practitioner will find here and there through the work, and especially in the chapters on Malarioid Diseases, much valuable information in relation to the singular influence of malaria in producing the most varied neuroses, which he will be able to make practically useful when practicing in our malarious country. Among the special chapters, we would especially commend those on Cerebral Paresis and Cutaneous Neuroses, which will be found to contain some novel views and practical hints.

The work is illustrated throughout by copious records of cases, which greatly assist us in making out the author's meaning, where his style is somewhat obscure.

The diagnosis in many of these cases is what would have been designated in our student days as "tall guessing," and some are not above a worse suspicion; but the general practitioner, little accustomed to thread the mazes of the complicated mechanism of the nervous system, where the lesion is frequently at one point while its only manifestation is at others often widely distant, will find in these records of cases, analyzed by a practiced hand, an invaluable guide in practice. G.

Use and Abuse of Poultices.

In his lecture recently delivered at the College of Physicians, Dr. Richardson made the following remarks on the subject of poultices:

The application of moist heat in the form of poultice to suppurating parts requires, I think, remodelling, in order that it may be placed on a true scientific basis. I am afraid that the common recommendation, "You must put on a poultice," is too often among us all an easy way of doing something about which we are not quite sure, and concerning which it were too much trouble to think long. From what I have recently observed, I fear that mischief is often done by a poultice, which might well be avoided. The people have always a view that a poultice is applied to "draw," as they say—a term in truth which, though very unsophisticated, is in a sense, a good term, for it means what it says. The question for us is, whether it be sound practice to carry out, as a general rule, the "drawing" process, either by fomentation or by poultice.

When a part is disposed to suppurate, the first step in the series of changes is an increased flow of blood through the capillary surface, followed by obstruction, and thereupon by an excess of sensible heat derived from the friction that is set up. Then follows transudation of liquor

sanguinis into the connective tissue, and its transformation, under the influence of heat, into what is called purulent fluid. When to the part in this state we apply moist heat, we quicken suppuration, mainly by upholding the temperature: at the same time, we secure the transference of water from the moist surface into the fluids of the inflamed part, by which tension of tissues is produced, and in the end yielding of tissue at the weakest point.

When the suppurating surface is circumscribed, the rapid induction of the process may be attended with little injury; but when the surface is large and when the exuded fluid is thrown into loose structures where it can burrow readily, the practice, I think, can not be good to extend the mischief. Hence, in the treatment of carbuncle and phlegmonous erysipelas, it can not, I opine, be sound practice in the early stage to apply moist heat. Experience also, not less than principle, warrants this conclusion. In cases of carbuncle especially, I have of late altogether avoided the application of moist heat in the early stages; and, I feel assured, with good results.

But when, in the course of local disease, suppuration is actively established, and is naturally circumscribed; when the increased temperature of the part has fallen to or below the natural temperature—then the value of moist heat comes on with full force; then the tension which is exerted determines the escape of fluid at the weakest point of the surrounding tissue, and, when the fluid escapes or is liberated by the knife, the escape for a long period is aided by the application of moist heat.

The continued application of moist heat for a long time after the escape of purulent fluid is again, I conceive, indifferent practice. It sustains discharge; it sets up unhealthy decomposition of fluids; it produces a thickened soddened condition of skin, most favorable to the production of sinus; and it retards recovery. When a surface

is freely open and suppurating, dry and not moist heat is the remedy. We are in want in these cases of a simple invention; we require something which we can apply as readily as a poultice which shall keep up the temperature of the part, and at the same time take up moisture, and gently dessiccate, without injuring the tissues.—*Brit. Med. Journal, May* 12, 1866.—*Am. Journal Med. Sciences.*

A Monster.

The following short account of a singular case of labor, and the birth of an extraordinary monster, was sent us by Dr. J. K. Hamilton, of Stone Mountain, Ga.

We very much regret not being able to obtain the much desired examination of the body, in order to ascertain the direction of the cord from the point of attachment, and the exact nature of the other peculiarities connected with the formation of this child.—*Atlanta Med. and Surg. Jour., Dec.*, 1866.

Editors Medical Journal: I was called, on the third of April last, to see Mrs. N., who was in labor with her first child, eight months *enceinte.*

I made a vaginal examination, and discovered a case of placenta prævia. The pains were regular and persistent, with slight protrusion of placenta during paroxysms. Considerable hemorrhage ensued, which was partially controlled by the tampon, cold applications and rest. The labor lasted about two hours: the afterbirth emerged first, and was followed almost immediately by the expulsion of the child.

The most remarkable feature of the case was: The umbilical cord was attached to the crown of the head, leading directly from the placenta, seeming to permeate

the brain, or more probably the inner surface of the scalp. The neck was unusually large, caused probably by an undue supply of vascularity and nervous influence, with a consequent developement of tissues surrounding them.

There was a cleft in the upper lip, constituting simple hare-lip. The abdomen contained a fissure extending from the epigastrium to near the symphesis pubis; hence the child was nearly disemboweled, with apparent obliteration of the umbilicus. The liver and intestines were well developed, and although it exhibited evidences of recent vitality, it came still-born, owing, doubtless, to the anomalous attachment of the placenta and cord. The father of the child, during the late war, lost his left forearm in Virginia, it being amputated about six inches below the elbow: the child, also, on same side, had its forearm off—the stump bearing a great similarity to the arm of the father.

The assimilation process in this instance, as respects growth and development, was normal, the trunk and limbs being properly proportioned.

I do not propose, in this short report, to attempt to explain the causes which may give rise to these preternatural perversions of the laws of the animal economy. In one respect it may have ensued from some accidental change of position experienced by the fœtus at some period of its uterine existence; and, in another, it may have originated from the influence of the maternal imagination on the fœtus in utero, or attributable to a primitive defect in the germ. Whilst we know and appreciate the opinions of learned physiologists, in regard to the causes of monstrosity, further deponent saith not.

J. K. Hamilton, M.D.

Death from Chloroform.

A death from chloroform occurred at Birkenhead on Thursday week last. The patient was a boy named Hughes, and the operation that was to be performed was lithotomy. The death took place previously to the performance of the operation, the boy ceasing simply to breathe, and the action of the heart ceasing almost at the same moment. The chloroform was administered with every care, and there was nothing in the condition of the patient to indicate special danger. The jury returned a verdict of death from chloroform, with an intimation that the anæsthetic "had been properly administered."

This case is very remarkable, owing to the youthful age of the deceased. It has been almost accepted as proven, that if moderate care be employed persons under fourteen years can hardly be exposed even to risk by chloroform inhalation. The fallacy of this view is now proved by a sad experience, and that which was thought to be a sequence is shown to be a coincidence. If the truth be told, neither in this fatal case, nor in the fatal case at Bristol, where the radial artery was about to be tied, need chloroform have been administered at all; unless it be proved that local anæsthesia would not have afforded every requirement for a painless procedure.—*Med. Times and Gaz., Nov.* 24, 1866.

Absorption of Wounds.

M. Demarquay read to the French Academy of Medicine a paper on this subject, of which the following are the chief conclusions: 1. A substance which is soluble in water, like iodide of potassium, when applied to a large denuded surface is rapidly eliminated by the saliva. 2. Applied to a recent wound, the presence of iodine is

recognized in the saliva in a period of time which varies between sixty, thirty, nineteen, and fifteen minutes. 3. When wounds are completely organized they possess great absorbing power, so that at the end of ten, eight, six, or four minutes, and even less, very evident traces of iodine are found in the saliva. We may, therefore, ask whether the septic element which gives rise to puerperal fever or erysipelas may not be absorbed by the wound itself. 4. In that dangerous complication of wounds known as purulent infection, may we not suppose that this absorbing power, which has hitherto been so little investigated, plays a considerable part, and will it not explain some of the phenomena generally attributed to phlebitis? 5. Iodine injections thrown into the cavities of abscesses or cysts are rapidly absorbed, elimination having been proved to have commenced in a period varying 'from forty-five to three minutes. 6. When these injections are employed in too great quantities, or too often repeated, harm may result from the incessant introduction of iodine into the system. 7. Iodine introduced by these various means is generally eliminated by the saliva and urine in from four to five days.—*Ibid.*

Inoculability of Tubercle.

In the *Gazette Hebdomadaire* we have a continuation of M. Villemin's researches as to the inoculability of tubercle. In rabbits he has again and again succeeded in reproducing it in this manner, not only when taken from the human subject, but still more rapidly when derived from the cow; further, the tubercular matter thus produced in one rabbit could be in like manner transmitted to another, in the same way as syphilis.—*Ibid.*

Sudden Death in a Dentist's Office.

Last week, Edmund Kerosin, a young man, twenty-three years old, entered the office of Dr. Ralph Lee, a dentist of this city, to have a tooth extracted. Anæsthesia was produced by nitrous oxyd gas, a cork having been placed between the teeth to keep the mouth open. As the tooth was extracted, we understand, it slipped from the forceps, and with the cork was drawn into the mouth. The tooth was subsequently thrown up from the stomach, but the cork—which does not seem to have been missed—entered the larynx, and by its presence there caused suffocation and death in an hour. A post mortem revealed the presence of the cork in the larynx and the cause of death. This case and its lamentable result should serve as a caution to those who employ such adjuncts in the dental laboratory, and the physician who may be suddenly summoned to patients in a dentist's office, should bear in mind the possibility of an accident like this, and be prepared to open the larynx, if need be, which in this instance would, in all probability, have given instant relief, and saved the life of the young man. —*Med. and Surg. Reporter.*

Poisoning by Strychnia; Cannabis Indica.

In a recent number, we reported in our periscopic department, a case of recovery from strychnia poisoning, by means of chloroform. We now add another, which recovered under the use of *cannabis indica*, and tr. of camphor. The case occurred in the practice of Dr. S. A. McWilliams, of Chicago, by whom it is reported in the *Med. Examiner.* Patient, thirty-one years of age, took, suicidally, five grains of strychnia. Was seen by Dr. McW. three hours and forty-five minutes afterward, when

he had extensive, frequent, and severe spasms, and with each a blowing of froth from the mouth. He lay upon his back, arms extending obliquely from his body; face flushed; perspiration rolling off him; pupils dilated widely; pulse one hundred and thirty per minute; color of lips natural; stiffness of muscles and inability to move limbs; mind perfectly clear. A drachm of the tincture of cannabis indica was immediately given, and another in five minutes; then two similar doses at intervals of ten minutes; afterward two such doses at fifteen minutes interval, with a rapid amelioration of symptoms; the next drachm was given in an hour and a half. The remedy, which afterward was alternated with camphor, was continued as the urgency of the symptoms demanded, and the patient recovered, with uninterrupted convalescence, after forty-eight hours.—*Ibid.*

Gun-shot Wound of Heart.

Professor Hamilton presented the specimen of a case, which had already been described several years ago in the *American Journal of Medical Science*, but the specimen had never been presented before to this Society.

It was a heart containing a bullet, of a boy who, when fourteen years of age, received a musket ball into the right side and shoulder, at Chatham Four Corners, New York. This was in 1840. The ball could not be discovered at the time. Six weeks after the injury he returned to work, and lived until 1860—twenty years—having been married in 1845.

Five years after the receipt of the injury he was attacked with violent palpitation of the heart, the result, as far as could be ascertained, of violent exertion, from which he never entirely recovered.

When he died in 1860, the autopsy revealed the presence of a ball in the right ventricle, near its apex, surrounded by atheromatous deposit. The heart was somewhat dilated, but not hypertrophied. His last illness was ascribed to cold, the result of exposure from washing sheep in a brook.—*Med. and Surg. Reporter, Dec.* 15, 1866.

Minute Injection and Preservation of Anatomical Subjects.

During the past two months, Dr. Joseph Jones, Professor of Physiology and Pathology in the Medical Department of the University of Nashville, has conducted a series of experiments upon the preservation of entire bodies for purposes of dissection, and anatomical and physiological demonstration.

Dr. Jones has succeeded in preserving the entire bodies of animals, which have remained for four weeks, in a close warm room, heated with a stove, without the smallest disagreeable odor, and without any marks of decomposition.

The antiseptic agent used by Dr. Jones in his experiments, is carbolic acid: the liquid carbolic acid, as commonly sold in the shops, is mixed with the usual injecting matters, and is thrown into the blood-vessels by the ordinary process.

For the human subject, used in dissection by students, and for class demonstration, Dr. Jones employs the following method: Two mixtures are required; one to fill the capillaries and smaller vessels, and the other to distend the larger vessels. The former, which will be called

No. 1, *Preservative Fluid for Minute Injection,*

consists of the following ingredients; the amounts given being sufficient to inject a single human body.

Three fluid ounces of carbolic acid; one pint of linseed

oil (oleum lini.); one pint of oil of turpentine (oleum terebinthinæ); one ounce of best Chinese vermillion (red sulphuret of mercury, hydrargyri sulphuretum rubrum). Mix the turpentine and linseed oil, and add the carbolic acid, and stir well together; then mix in thoroughly the coloring matter. Inject this fluid mixture slowly and steadily into the arteries.

No. 2, Preservative Fluid for the Injection and Distension of the Large Arteries and Veins.

Carbolic acid, four fluid ounces; oil of turpentine, one quart; linseed oil, one quart; tallow, one pound; bees-wax, one pound. Mix the turpentine and linseed oil, heat carefully, and then add the tallow and wax; and after the complete melting and mixture of the wax and tallow, remove the vessel from the fire, and add the carbolic acid and coloring matter; stir this mixture well, and inject whilst hot, into the large blood-vessels.

This last injection forces the first fluid injection into the most delicate capillaries, and thus brings all parts of the body under the influence of the carbolic acid.

The proportion of wax and tallow in the Injection Mixture No. 2, may be increased or diminished, as the object may be to produce a harder or softer material, upon cooling; and it is best to immerse the subject in hot water, during the injection of this mixture.

The first injection should not be allowed to flow out of the arterial system.

This method is best applied to subjects designed for anatomical dissection and demonstration.

For minute anatomical injections, designed to make dried preparations, the mixture of turpentine and linseed oil is not suitable as a vehicle for the carbolic acid and coloring matters. Turpentine does not dry readily.

For dry preparations, Dr. Jones is in the habit of employing Canada balsam (Canada turpentine, balsam of fir,

terebinthina Canadensis) as a vehicle, and sulphuric ether as a solvent. The carbolic acid mixes readily with the ether and Canada balsam; and the coloring matter is well suspended. Tallow and wax may also be dissolved in the Canada turpentine by the aid of heat.

When an organ thus injected is exposed to the air, the ether evaporates rapidly, and the Canada balsam gradually dries to a hard material, enclosing the coloring matter, and filling up the blood-vessels.

The method employed by Dr. Joseph Jones, is also of great value in the preservation or embalming of bodies for transportation to a great distance, or for any other purpose. When the colored fluid is properly injected, it tends to impart a life-like appearance to the skin.

It is well known that carbolic acid arrests fermentation and putrefaction, and destroys the lower forms of vegetable and animal life.

As far as the experiments in the University of Nashville have extended, carbolic acid appears to be the best of all antiseptics for the injection of bodies designed for dissection, and must supercede, in the dissecting room, the chloride of zinc, which discolors the structures, and injures the knives; and the poisonous arsenious, and arsenic acids, which endanger the health, if not the life, of those who dissect habitually.

Dr. T. B. Buchanan, Curator of the Museum and Prosector to the Chairs of Anatomy and Surgery in the University of Nashville, is also conducting a series of experiments upon the preservation of organs and tissues, in water impregnated with carbolic acid. Such a mixture would be infinitely cheaper than alcohol, and such experiments have a high practical value. Up to the present time, the results obtained by Dr. Buchanan have been most satisfactory.—*Nashville Jour. of Med. and Surg.*

Reduction of the Subcoracoid Dislocation of Humerus.

Dr. Alexander Gordon states (*Brit. and For. Med. Chir. Rev.*, October, 1866) that he has successfully employed, in nine consecutive cases, the following mode of reducing this dislocation:

"If the right shoulder be dislocated, I place the patient on his back, with the shoulders raised, in bed, or on a mattress laid on the floor, or on a sofa. Standing on the same side, and raising the elbow, I grasp the lower end of the right humerus; the thumb on the inner, with the fore and other fingers on the outer side, the forearm lying flexed at an acute angle, resting on the web between the thumb and fingers. I raise the arm upward and forward, so as to place it at right angles with the surface upon which the patient is lying. Besides, to have complete muscular quiescence, I tell the patient to permit the extremity to rest upon and be supported entirely by my left hand. With the right hand I feel for the head of the dislocated humerus, and press it downward and outward, either through the anterior wall of the axilla or in the axilla, moving at the same time, with the left hand, the lower end of the humerus upward and backward, with rotation chiefly inward.

"Whilst thus engaged, I have felt on several occasions a snap or jerk, so marked as to lead me to suppose, for the moment, that the dislocation was reduced. This snap or jerk is due to the head of the humerus having changed its position; for when we depress it we free it from the coracoid process, and the supra and infra-spinati muscles, being on the stretch, jerk it outward to the anterior border of the glenoid fossa. When in this position, with the fingers in the axilla, I can feel almost the whole of the upper articular surface of the humerus, which I press outward and forward; or, in other words, I lift the head

of the humerus over the inner margin of the glenoid cavity, assisting with the left by rotation and very slight extension, if necessary, when the head enters the glenoid fossa with a distinct snap."

Dr. Gordon is convinced that this mode of reduction is equally applicable to other forms of dislocation of the humerus.—*Am. Jour. Med. Sciences.*

A Remarkable Solvent.

It is now discovered, it appears, that if a piece of copper be dissolved in ammonia, a solvent will be obtained, not only for lignine, the most important principle of all woody fibre, such as cotton, flax, paper, etc., but also for substances derived from the animal kingdom, such as wool and silk. By the solution of any of these an excellent cement and water-proofer is said to be formed; and, what is equally important, if cotton fabrics be saturated with the solution of wool, they will be enabled to take the dyes—such as the lac dye and cochineal hitherto suited to woollen goods only. Hydriodide of ammonia, we may also observe, was long since discovered to be an equally remarkable solvent of the most refractory, or, at least, insoluble mineral substances. Now it is an interesting circumstance that ammonia, according to Van Helmont, and other old chemists and alchemists, was one of the requisite materials in the "formation of the alkahest," or "universal solvent," of the ancient sages.—*Detroit Review.*

—Surgeon Ebon Swift, U. S. A., is suing the Hannibal and St. Joseph Railroad for loss of his baggage. He claims $5,958 50 damages, one half of the amount being estimated to be the value of an unpublished work of his on "Veterinary Surgery," the manuscript of which was in his trunk.

A New Remedy in Erysipelas—Iodide of Potassium.

Dr. H. B. Withers, of Rantoul, Illinois, writes to the *Chicago Med. Journal* that he has used iodide of potassium in about thirty cases of erysipelas with perfect success. It arrested the disease in from twelve to thirty-six hours. He gives usually ten grains every two hours, observing closely the effect. As soon as the disease begins to subside, the medicine is discontinued. No external application is used, but the parts are simply kept covered and moist. The author does not recommend it as a specific, but considers it a very valuable remedy in the disease.

Organic Remains.

Among the passengers recently at St. Louis, by steamer from the Upper Missouri river, was an agent of the Smithsonian Institution at Washington, D. C., in charge of a large number of petrified organic remains for the Smithsonian Institute and the Philadelphia Academy of Natural Science.

The collection, which comprises over three hundred different kinds of small animals, extinct and living, together with bears, etc., of mammoth size, was made in Dakotah Territory, near the head of White river, by Professor Hayden.

A New Diagnostic Sign in Disease of the Kidneys.

According to M. Corlieu, the odor of cubebs, asparagus, etc., can be detected only in the urine secreted by healthy kidneys; and reasoning by exclusion he maintains, that where this sign is absent, the kidneys must necessarily be diseased.—*Med. Record, Feb.* 15, 1867.

MEDICAL COLLEGE COMMENCEMENT,

AUGUSTA, MARCH 1, 1867.

The ceremony of conferring the Doctorate took place at the Masonic Hall, in presence of a large and appreciative audience. The Trustees and Faculty, accompanied by the Students, arrived at twelve o'clock, when the Vice President, C. F. McCay, L.L.D., took the Chair, and the meeting was opened with prayer by the Rev. Mr. Lamar. The Report of the Dean, Dr. L. A. Dugas, was then read, and, on motion, accepted; after which the Vice President felicitously extemporized words of wisdom to the Graduates, and proceeded to confer upon them the degree of Doctor of Medicine. The Rev. Dr. H. H. Tucker followed with an address of rare excellence and fine taste, fully sustaining the Reverend gentleman's high reputation as an accomplished orator. Finally, a chaste and manly valedictory address was delivered by Dr. Wm. H. Foster, of this city. The whole ceremony was effective and highly creditable to all the parties concerned.

The Class in attendance on the session just closed numbered seventy-three, of whom forty-five were from Georgia, eleven from South Carolina, eleven from Alabama, two from Texas, two from Pennsylvania, one from Virginia, and one from Florida.

The following is a list of the Graduates:

Francis L. Brooks, of Columbus, Ga.
James A. Dozier, of Columbia County, Ga.
William R. Eve, of Richmond County, Ga.
William H. Foster, of Augusta, Ga.
William R. Gates, of Kingston, Pa.
Thomas C. Gower, of Gainesville, Ga.
Samuel S. H. Gray, of Gainesville, Ga.
Ludy M. Henderson, of Mt. Pleasant, S. C.
Charles N. Howard, of Cusseta, Ga.
Robert T. Jennings, of Galveston, Texas.
Thomas L. Lallerstedt, of Augusta, Ga.
Thomas J. Lumpkin, of Lafayette, Ga.
Frank H. Matlack, of Downington, Pa.
James K. McWhorter, of Pickens District, S. C.
James M. Milton, of Greenville, Ala.
Thomas M. Murdock, of Burke County, Ga.
Redden J. Reid, of Bartow County, Ga.
Cornelius O. O. Roberts, of Lake City, Fla.
Richard P. Spencer, of Hicksford, Va.
Henry T. Templeton, of Laurensville, S. C.
Losson J. Turner, of Sterling, Texas.
William F. Wilson, of Hannahatchee, Ga.

PROFESSORIAL CHANGE.

Dr. I. P. Garvin having resigned the Chair of Materia Medica, Therapeutics, and Medical Jurisprudence, in the Medical College of Georgia, Dr. Wm. H. Doughty, of this city, was elected to fill the vacancy.

FACULTY OF THE MEDICAL COLLEGE OF GEORGIA, AT AUGUSTA.

I. P. GARVIN, M.D.,
Emeritus Professor of Materia Medica, etc.

L. D. FORD, M.D.,
Professor of the Theory and Practice of Medicine.

JOSEPH A. EVE, M.D.,
Professor of Obstetrics and the Diseases of Women and Infants.

L. A. DUGAS, M.D.,
Professor of the Principles and Practice of Surgery.

G. W. RAINS, M.D.,
Professor of Chemistry and Pharmacy.

EDWARD GEDDINGS, M.D.,
Professor of Physiology and Pathological Anatomy.

DESAUSSURE FORD, M.D.,
Professor of Anatomy, general and descriptive.

WM. H. DOUGHTY, M.D.,
Professor of Materia Medica, Therapeutics, and Medical Jurisprudence.

JOHN L. COLEMAN, M.D.,
Demonstrator of Anatomy.

L. A. DUGAS, Dean.

☞ Notice of works received will appear in our next.

SOUTHERN

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ORIGINAL AND ECLECTIC.

On the true Homologies of some Structures, usually accounted Epithelial. By Edward Geddings, M.D., Professor of Physiology and Pathological Anatomy in the Medical College of Georgia.

The rapid advance of cellular-physiological and pathological doctrines in recent times, which bids fair to bring about a total reform in medical science, lends a peculiar interest and value to any attempt to trace out the natural affinities of the cellular elements, and the laws which govern their protean transformations. We have learned to refer everything essentially vital, the prime movement in every living act, not so much to the adjustment of the living mechanism as a whole, but to the individual cellular elements themselves, to regard the organism as a society of living Monads, each of which contains within itself all that gives peculiarity to its acts, while it is dependent on its association with the rest only for a supply of the physical conditions necessary to every manifestation of vitality, food, warmth, moisture, and oxygen. There is

little doubt in the mind of any real physiologist of the present day, that could we, without injury, transplant a single organic cell from one organism to another, in which it would be furnished with the necessary physical conditions, it would continue to grow, produce its kind, and perform all other characteristic acts exactly as in its original site.

Under such circumstances it is of the last importance, to the just appreciation of any physiological or pathological action, that we should comprehend, as far as possible, the actions of the individual cellular elements into which it might be analysed. We must not only endeavor to understand those characters which distinguish all kinds of cell life, but those peculiarities in which they differ one from another. We must compare them, trace their similarities and differences, assemble them in groups, according to the degree of their affinities; in a word, classify them.

In a series which, like the constituent cells of the living organism, start from a single typical form, and reach their ultimate characteristic qualities by a successive transformation and repeated divergence, it were natural to expect to find a number of sharply-defined groups, such as have been so beautifully established in the great series of animate beings, class, order, and species, in which the later divisions would contain the qualities of that which preceded them, while differing from each other in other respects. Very little has been done in this direction. We have numerous classifications of tissues, from Bichat down, all bearing more or less the impress of the peculiar tendencies of the school from which they emanated, but a real natural classification of cells has never been attempted.

Nevertheless, the researches of the great micrographists of our day, Reichert, Henle, Remak, Robin, Virchow,

Kölliker, and others, clearly indicate the limits of the first great division, the classes. We have gradually become familiar with three great divisions of animal cells, to which most of the existing forms could, without much difficulty, be referred, viz.: the Epithelial, the Connective, and the Nervo-muscular.

It is not the object of this paper to pursue this classification farther, nor to show how far such a division of cellular elements into the three great classes mentioned, is justified by known facts. But assuming it to be correct, it is intended to exhibit that certain structures, which have been usually reckoned among the epithelial, ought in reality to be referred to the connective series. Such are the serous membranes, the lymphatic ganglia, and the blood-cells.

In the classification of cells, as of other series of natural objects, we must not rely too much on one or more prominent characters, but should, as much as possible, compare all their known qualities. The failure to follow this rule has been a fruitful source of error in the history of zoological classification. I need only allude to the marsupials, the cirrhipeds, and others. So, in the classification of cells, the general observations that most free surfaces were covered with epithelium, and that epithelial structures consisted of closely-packed cells without interstitial substance were alone deemed sufficient to place the serous membranes among the epithelial structures. So, likewise, the general resemblance of the lymphatic ganglia to glands, and a supposititious function, led to a classification of the lymphatic ganglia, among epithelial structures. Neither of these generalizations will bear the test of closer scrutiny, and a comparison of all the known characters of such structures.

In the present state of our knowledge of cell-life, I think that characters for comparison can be drawn from

the development of cells, from their anatomical form and connections, their physiological and pathological transformations, one into the other, and their living acts under normal and abnormal conditions.

One of the earliest acts of the embryo, after the fissure of the yelk, is to divide itself into three parts, from which very different structures arise—a lower or visceral germinal membrane or layer, an upper or animal layer, and a medullary tube, the foundation of the nervous centres. Now, it was shown by Remak, long ago, that nearly all glandular and epithelial structures were derived from the lower or visceral layer. This membrane, in conjunction with the animal layer, curves downward and inward, and gradually encloses a tube or cavity, which eventually becomes the intestinal canal. Conjunctiva nares and pharynx are originally parts of this great cavity, and remain connected with it throughout life. From it are developed many homologous structures, all undoubtedly epithelial, viz.: the lachrymal glands, the salivary glands, the lungs, the thyroid gland, the thymus, the liver, the pancreas, and the genito-urinary cavity (allantois, corpora wolffiana, ductus Mülleri). All these structures are developed in exactly the same way, by a process of gemmation. One exception is usually admitted to this law of Remak, the epidermis, with its appendages, nails, hair, and horns. But there is just a possibility of error here. It is well known that, at a very early period of embryonic life, two buds or protrusions, one before and one behind, are shot off from the margin of the umbilicus, which, curving over the ends of the embryo, gradually envelop it in a double membrane, or bag. As usually described, these vesicles are developed from the animal layer alone, and the outer bag coalesces with the chorion, while the inner becomes the amnion. But

it is possible, in view of the great difficulty of investigation at this period, that the visceral layer may likewise follow the animal, in the protrusions, and that the outer bag should become the amnion, while the inner would become the epidermis. This would give the embryo a covering of epithelium, and the amnion the epithelial lining it undoubtedly possesses at a later period.

As is known, the majority of connective structures, such as the bones, cartilages, ligaments, tendons fasciae as well as the loose areolar tissue, is developed from the upper or animal layer. It may be considered an open question, whether the same distinction can be shown between these and the third group, the nervo-muscular. It would seem like a heresy to say that nerves and muscles are developed from the medullary tube, and not from the animal layer, where we usually find their first traces. But such will eventually be, I believe, the established fact. It has been well made out, that the nervous portion of the organs of special sense are developed by protrusion from the anterior extremity of the medullary tube, and it would be but a fair analogy to suppose that other nerves were evolved in the same way. In point of fact, we see about this time a series of dark lines shoot out from the medullary tube, one for each vertebra, and extending even beyond the limits of the embryo. It is impossible to say that these are the foundation of the future nerves and muscles, but it is not impossible. Again, when any part of the medullary tube, from which the organs of sense arise, is defective, the corresponding organ of sense is wanting also. Now we find the same law in regard to other nerves and muscles. When any portion of the nervous centres is defective, not only are the nerves which should spring from it wanting, but the muscles also, even the heart. This well-known law of pathological embryology does not hold the other way, for the muscle may be

wanting, while the nerve is intact, or the nerve be defective, while the centre exists. These facts furnish strong presumptive evidence that nerves and muscles are originally developed from the medullary tube, but at so early a period that it has escaped attention.

Th° three great types of cells are thus distinctly laid out at the earliest period of embryonal life. Subsequently they extensively interpenetrate each other, but at first they are distinct. It will not be difficult to show that the serous membranes are developed from the second or connective series.

When the division takes place between the visceral and animal layer and the medullary tube, there remain two cavities, which mark the separation. These are the great serous cavities, the pleura and peritonaeum (at first one), and the arachnoid and their walls are the serous membranes. Now if we examine the evolution of the embryo more attentively, we find that it is only the lining of the visceral and medullary tubes, which become respectively the epithelial and nervo-muscular structures. Outside of each of these remains a layer of cells, which, in one case, becomes the fibrous connective stroma of the intestine and glands, and in the other the fibrous portion of the arachnoid and neuroglia. So that the great serous tissues are developed from and among cells of undoubted connective type. The synovial capsules, sheaths, bursae, etc., are of course developed from the same source, but what is more to the purpose, they may, at any time, develop adventitiously. Wherever two parts slide over each other, there we will find a bursa make its appearance, and we can distinctly trace its formation, from the loose connective tissue, by the gradual proliferation of the stellate cells, and the secretion of mucine instead of fibrogenic material, by a partial reversion, therefore, to the embryonic type.

All this applies equally well to the blood-vessels, and their serous lining, the endangium. They make their appearance in the upper or animal layer. Some embryologists admit a special or vascular layer, where the vessels are developed, but this is incorrect. It is never truly separated from the upper or animal layer. As is well known, the first blood-cells are developed from the same cells as the walls of the vessels, and in situ. Precisely the same thing may occur at any period of life. Wherever we have a new growth, from connective tissue, there will we find a new formation of blood-vessels, and according to some of blood-cells, perfectly distinct from already existing vessels. But this is only from connective structures, never from epithelium. We may have the most massive development of epithelial cells, as the cholesteatoma, or pearl tumor of Müller, where they form large rounded masses of closely packed cells, or in horns, but never do we see such structures penetrated by vessels, unless they are, at the same time, permeated by a stroma of connective tissue. Very instructive, in this respect, is the comparison of true horns and antlers. Both are intended for the same purpose, but one is epithelial, the other connective structure. The first are never permeated by vessels, the other always during the period of their growth.

From the anatomical form we can glean but little in support of our argument. The serous cells exhibit indeed a tendency, but a tendency only, to assume the characteristic fusiform and stellate shapes of connective cells, especially in the blood-vessels, but as similar indications of a tendency to assume the fusiform shape at least are to be found among cells, undoubtedly epithelial, in the urinary passages, the sign is of little value. Even the most characteristic peculiarity of connective tissue, the presence of the intercellular cement, is wanting in the

serous membranes. The cells are as closely packed as the pieces of a mosaic. This may be the reason why they do not send out their characteristic prolongations. Both characters, however, make their appearance when the structure hypertrophies. Something like this is normally observed in the synovial structures where the cells never form a continuous covering, but the interstitial substance is here and there uncovered. Here we not only find fusiform, but even star-cells.

Very important, on the contrary, are the anatomical transitions. If we compare vertical sections of serous and mucous membranes, as we can easily do in the intestine of small animals, where the two are in close apposition, we will find the margin of the mucous epithelium, where it strikes the connective stroma, sharply defined. Not so the serous. It is impossible to tell where the serous tissue ends, and the connective commences. As we pass outward we find the star-cells at first perfectly discreet, gradually becoming more crowded, and shortening their processes until they pass, by insensible gradations, into the cells of the serous covering. This is especially the case with the vessels, particularly those of small size. To see this distinctly, we should examine the vessels of the living animal, and I can recommend for this purpose the mesentery of the lizard. Not only are the structures more transparent during life, but when the vessel is contracted, as after death the condensed portion is drawn away from the rest, which gives an apparent distinctness to the vascular tubes, which they do not really possess. So, also, when the vessel is injected, the walls are compressed, and again appear more distinct. But in the living animal the vessels appear in their true character, as mere channels in the connective tissue. As we approach the cavity, the cells become more numerous and more crowded, and finally pass into the characters of

the endangium. I am here speaking only of the smallest vessels. In the larger the interposition of the elastic and muscular elements gives them the character of independent tubes, as well as their stratified appearance. But, if we imagine these taken away, even the larger arteries would appear as channels in the connective tissue.

The transition from connective cells to serous structures seems to have struck all observers. Thus Henle, starting from the idea that the serous covering was real epithelium, speaks of the connective cells beneath as "metamorphosed epithelium;" and Kölliker, commenting on the subject, says: "The similarity of these layers, which I will call the striated layers, with the fibre (connective) cells beneath, and the epithelium does not justify us in considering them as derived from the latter, since nothing proves that the two are genetically connected. * * * But, it seems to me, allowed to consider them as originally of equal value, originally the same, but developed in different directions." (Kölliker Gewebelehre, p. 544.) Remak proposed to call the serous layer the cell layer, "because it, differing in this respect from other epithelium, passed into the connective structures without defined limits, so that we frequently can not tell where one commences and the other stops." (Ibid.)

It may as well be mentioned here, that our ideas of the structure of the capillaries have recently undergone a considerable modification. We no longer consider them as a network of star-cells, in the interior of which the blood circulated; nor do we regard them as formerly, as structureless tubes. They consist, like the endangium everywhere, of a mosaic of flattened fusiform, or even stellate cells closely fitted together. So delicate are they, so perfectly adjusted, that we fail to discover the limit between them; but the silvering method, as now prac-

ticed, plainly exhibits the outline of a cell around each nucleus.

The transition of serous structure to fibrous, is not the only one we can demonstrate. In every joint we can show the transition from cartilage to synovial structure. The latter, as is known, does not cover the head of the bone, the cartilage is quite bare, but where the capsule joins the cartilage, we can see every stage of transition, from one to the other. In the spleen and the lymphatic glands, we can distinctly trace the splitting up of the ends of the vessel, intima and all, into ordinary connective tissue. We will return to this presently.

In comparing the physiological characters of serous tissue with the epithelial and connective structures, it must be remembered that the two last represent classes, the physiological characters of which may be variously specialized in the different species that compose them, and it is not always easy to seize the general characters amidst the mass of detail. In general it may be said that it is the office of epithelial structures, to secrete some material, differing, more or less, from the general nutritive material from which it is made. The connective, on the other hand, performs mechanical functions, builds up the solid framework of the organism and of the individual organs, binds parts together and facilitates their movements upon one another. The distinction is marked enough if it could be carried out, but there are various difficulties. Thus, the epidermis, with its appendages, performs a mechanical part in protecting the subjacent structures, but it does so by a true secretion, the elaboration of a substance widely differing from the nutritive plasma, keratine. Again, all cells secrete, and so do the connective, but their secretion is the same everywhere; when young, mucine; when old, fibrogenic material. This would be characteristic enough if the epithelial

structures did not sometimes secrete the same materials. Mucine is secreted by laminated epithelium, but there remains the distinction that in general mucine is the secretion of ripe epithelium, but of young connective cells. More characteristic is the fibrogen material. True epithelium sometimes secretes fibrine, or at least a coagulated proteine substance, closely resembling fibrine in its physical character, as we see in diptheritic and croupous inflammations, and even in the ordinary inflammation of single-layered epithelium, such as lines the ultimate ramifications of many glandular structures, as the lungs, kidneys, salivary glands, etc. But too much weight must not be laid on the physical characters of the proteine bodies, for their protean transformations, under varying conditions, are but little known. Physiologically, fibrogen material and croupous exudation are two very distinct things. Never do we see the latter, like the former, undergo the transformation into fibrillated cement, never form those adhesions and indurations, so characteristic of connective structures. We may, therefore, say in general terms, that a structure which, when young, produces mucine, and when old, fibrogen material, belongs to the connective series.

Tested by these physiological characters, the serous structures clearly coincide with connective tissue. Their function is purely mechanical, to allow different parts to move freely on each other, and in this respect they assimilate to the loose areolar tissue. When under morbid conditions, two parts begin to move freely on each other which did not move before, there we will usually find an adventitious development of serous structure, and always from connective cells. When serous membranes secrete anything beyond the ordinary nutritive plasma, it is always mucine or fibrogen material, never more special secretions.

A striking peculiarity of epithelial structures is, that they are deciduous. They are being constantly cast off, and replaced by others. Not only do we find them in all secretions, but when these are retained, as in the first formation of all true cysts, they accumulate, and render the fluid opalescent or opaque. Nothing of the kind occurs with serous structure. The fluid is either transparent, or, if troubled, it is from coagulated fibrine or pus. The serous cells are not transient, but permanent structures, the duration of whose existence, like other connective cells, equals that of the organism.

As a physiological peculiarity of epithelial structures, may be mentioned their tendency to throw out protrusions, or crypts, which frequently branch, as in true glands. This we never see in serous membranes; they are always perfectly smooth, and never form glandular structures of any kind.

The above characters derived from their development their anatomical form and relations, and their physiological attributes would, I think, be sufficient to remove the serous structures from the epithelial series, and establish their homology with the connective, but the induction is still more strikingly borne out by the phenomena they exhibit under pathological processes. Herein lies the great importance of placing them in their proper class, since this at once gives us the key to the transformations they are likely to undergo.

When epithelial structures hypertrophy, either the cells, as they multiply, are cast off, or they rêmain attached, forming thick laminated masses, without interstitial substance. When the hypertrophy starts from the connective layers beneath, forming warty excresences, the epithelium is never broken unless by ulceration, but forms a continuous, more or less, thickened investment. With the serous membranes it is very different. Let any one

examine the vegetations so frequently found upon the valves of the heart or the pericardium, and he will find that they consist of connective tissue in various stages of development with well-defined interstitial tissue, without a trace of investing epithelium. Yet the latter has by no means been cast off, for such vegetations may cover the whole face of a serous membrane without our finding any cells in the serous exudation.

Very characteristic are the differences of the inflammatory process in the two classes of structures. In epithelium the active congestion is followed by a copious secretion of thin albuminous fluid, which soon passes into the ordinary thick glairy mucous. Simultaneously, there is a rapid proliferation of the epithelium, the cells of which are rapidly cast off from the outer layers, rendering the fluid at first opalescent, then opaque. At first the cells have all the characters of ripe epithelium, but as the process progresses, younger forms make their appearance; at first large rounded granular cells, gradually followed by smaller and smaller, until they reach the form of small round granulated cells, with tripartite or multiple nuclei, usually regarded as characteristic of pus. When the process runs off, the secretion diminishes by degrees, riper forms make their appearance, and complete "restitutio ad integrum" results, provided the process has been confined to the epithelium, and the connective structures beneath have not been laid bare. Such is the well known picture of ordinary catarrhal inflammation.

Nothing of the kind occurs in serous membranes. These structures inflame like a wound, *i. e.*, like connective tissue, with a secretion of fibrogenic material and the formation of vascular granulations, and the result is invariably, unless the process has been confined to its earliest stages, not a complete "restitutio ad integrum," but a new growth of inodular tissue with the well known

indurations and contractions, characteristic of the inflammation of connective structures. The inflammatory vegetations of serous membranes, which are here put forward as the homologa of granulations, are larger and less vascular than these, but scanty vascularization is characteristic of serous membranes generally, and their large size is probably owing to the fact that generally all the cells ripen, whereas, in ordinary granulations, a large part are cast off as pus. It might be objected to the distinction, just tried to be established, between the inflammatory process in epithelial and connective structures, that the former may, and often do, secrete fibrine, and that the highest development of the process is identical in both, the production of pus; but, as already pointed out, the fibrine of epithelial structures (diptheria, croup, pneumonia, morbus Brightii), is not identical with the fibrogenic material of connective and serous tissue, for it never organizes, never forms inodular tissue. In the next place, it may be doubted if the pus in these two cases is identical. The morphological characters are, it is true, the same in both. But what are they? The characters of young cells everywhere, of the young blood-cells in blood, and lymph of the embryonal cells in the egg. But do they secrete the same thing? We possess no reliable chemical analyses on this point. But if the nose might be allowed to take the place of such, I should say decidedly not. The odor of pus is so characteristic that it reveals to the practiced olfactories of the surgeon the presence of the smallest wound in any part of the body. But does any one recognize anything like this in a purulent ophthalmia, a violent coryza, a bronchitis, or a gonnorrhœa? As a chemical character, every one must have observed that epithelial pus does not blacken silver instruments, or at least not to the same extent as ordinary pus. This would indicate the absence of unoxydized sulphur,

so characteristic of the pyine of Gueterbock." Catarrhal pus frequently undergoes putrid fermentation, and develops intolerably fœtid odors, but they are, as every one knows, different from those of ordinary pus.

In every respect the inflammation of serous membranes is identical with that of connective tissue. They secrete fibrogen material; a part of which forms ordinary fibrine, a part true fibrillated cement, and any cells that are developed, assume the characters of connective cells or true pus. Never do we find a thickening of the so-called epithelium, or a casting off of cells in mass, except as pus. The surface of the pseudo-membrane, or when formed, of the vegetations, is always bare, and we never find, as in croup and diptheria, the epithelium underlying the false membrane.

In general, the serous structure shows little tendency toward the production of pus, unless it is exposed to the air, or has been infected by a purulent deposit elsewhere, as in puerperal peritonitis, metastatic pleuritis, etc. Herein we have a most direct analogy with the connective tissues, for it is a fact familiar to every one, that the most severe contusions and lacerations of the connective tissue do not lead to suppuration, provided they are subcutaneous.

The formation of vascularized pseudo membranes, granulations, and adhesions, so common in serous membranes, are equally characteristic of connective tissue, for nothing of the kind is ever known to occur in epithelial structures. These never exhibit either vessels, granulations, adhesions, or contractions, unless the epithelium is broken, and the connective structures laid bare.

It might be objected that in all these cases the epithelium, as a single layered epithelium, is cast off, or degenerates (Buhl). But why does not the same thing occur in the inflammation of single layered epithelium, else

where? Why does not every pneumonia end in induration and organization of the exudation?

All this applies equally well to the endangium, for nothing is easier than to excite adhesive inflammation in the blood-vessels, and when a thrombus organizes, its newly-formed vessels communicate directly with the vasa vasorum, while the endangium remains intact, a circumstance that never occurs in any epithelial canal.

Most of the degenerative processes occur in both classes of structures. Thus the fatty and the amyloid degeneration, as well as the formation of pigment, occur as frequently in connective structures as in epithelium. All are found in serous membranes. To this the calcareous degeneration forms an exception. There is but one case where a deposit of lime salts takes place in epithelial cells under physiological conditions, and that is in the enamel of the teeth. The exceedingly rare calcareous degeneration of cataract is, perhaps, the only well-authenticated instance in pathology. On the contrary, nothing is more common than to find a deposit of lime salts, or even the formation of true bone in connective tissue. Both are common in serous membranes, and although such degenerations usually develop in the depths of the membrane, and subsequently extend to the surface, yet we can often distinctly trace at the margin of the deposit, the calcareous degeneration of the serous cells, especially in atheroma, and the osteophytes of the synovial membranes of joints.

Nine-tenths of morbid growths develop from connective structure, and all of these occur in serous membranes, but it is impossible to say, in any particular instance, whether from the serous cells or the connective stroma beneath. The tubercular process, however, offers us a case in point. A tubercle, according to the best and most recent authorities, consists of a small mass of cells,

formed by a rapid proliferation, and destined to undergo an equally rapid degeneration. Hence they never attain any considerable size, the process being carried on by a similar proliferation, and degeneration from other centres in the neighborhood. These may coalesce and form larger masses, but each tubercle must be regarded as a distinct development. Now, although nothing is more common than to find tubercles in mucous membranes and in the skin, they never take their origin from the epithelium, which may be traced in the early stages, passing over them perfectly intact. Nowhere is this more distinct than in lupus. Here the insulated tubercles extend for a considerable distance beyond the externally apparent margin of the disease; but we do not see them, because they are covered by sound epidermis. If however, we, with a probe, press somewhat rudely upon different points of this apparently sound skin, the instrument will penetrate every now and then into the tubercular mass beneath. In the tubercles so frequent upon serous membranes, it is different. The individual tubercles are upon the very surface, and we would look in vain for the serous covering. It is from the serous cells themselves that the morbid development has taken place.

Characteristic of epithelial structures are the various forms of epithelioma, of which we have several varieties, some benignant and others sufficiently malignant in their nature. These tumors, easily recognized by the epithelial nature of their elements, may penetrate any kind of structure, but they are never primarily developed, except from epithelium. This is not conceded by all, but the facts which seemed to indicate a transformation of connective cells into epithelium, under certain circumstances, such, for example, as the development of epithelial masses in the neighborhood of epitheliomata, but in the midst of connective tissue, observed by Schroeder van der Kolk,

have recently received a readier explanation in the discovery of the spontaneous movements and wandering propensities of many young cells. The fact remains that the first development of such tumors is always from epithelium. In accordance with this, we never see a development of epithelioma from serous membranes. When it occurs there, it is by extension from other parts.

Cysts are so much more frequent in connection with epithelial structures than anywhere else, that they may be almost said to be peculiar to them. If we except a few rare cysts, the origin of which is unknown, but which probably reaches back to an early period of embryonic life, and the pseudo-cysts, formed by degenerative processes in other tumors, perhaps all cysts occurring in connective tissue, and unconnected with epithelial structures at any period of their development, may be referred to hypertrophied or otherwise altered synovial bursae, normal and adventitious. This difference between the two classes of structures is also reflected in the serous membranes, for apart from the serous bursae, the rarity of cysts in serous membranes is well known. The only point in these where cysts are at all frequent, is at the broad ligaments of the uterus. But the real origin of these is to be sought in the corpora wolffiana of the embryo. They are analogous to cysts at the head of the epididymis in the male, and must be regarded as epithelial.

Thus, wherever we are able to establish a characteristic difference, anatomical, physiological, or pathological, between the two great classes of cells, the connective and the epithelial, we find the serous membranes everywhere corresponding with the former, and differing from the latter in every essential particular. In many respects, doubtless, the qualities of the serous structures seem to fade into those of epithelium; but when we review the

whole chain of phenomena, and assemble in one picture all the known qualities they present under the various circumstances, we can not escape the conviction that their true homologies are to be sought in the connective structures, bone, cartilage, and fibrous tissue, and not, as now universally assumed, in epithelium.

The value of such an attempt to establish the true relations of an extensive and important system of cells, will be very differently estimated by those who are, and those are not impressed with the great value of the discovery of the organic cell to the science of life. The first will regard it as idle speculation, while those who look upon cell-life as the future stand-point of far more general views in physiology and pathology than we now possess, will see in it an attempt to begin a labor which the science will have to accomplish, by more extended observation, and the superior resources which the future will certainly bring. The views above put forth, even though erroneous, have the advantage of connecting together and exhibiting in a clearer light many points long since empirically established in practice. We see, for example, why we can not treat an epithelial cyst like an hydrocele or a synovial bursa, by iodine injections; why it will not do to admit air into a serous cavity; why the inflammatory process leads to such widely different results in a serous and a mucous membrane; why the rheumatic process attacks and makes metastasis to every serous membrane in the body, while the numerous epithelial structures remain constantly exempt; why the erysipelatous pyæmic and septic inflammations are so apt to extend to the serosae, while the catarrhal, croupous, and diphtheritic processes, peculiar to epithelial structures, never attack the serous membranes in their original form, and show little tendency to extend to them, even when in immediate proximity.

Whatever applies to the serosae generally, and especially to the endangium, will of course apply equally well to the lining of the lymphatics, which exhibits precisely the same structure. From the recent anatomical researches into the structure and termination of these vessels, we can gather some new facts in support of the views advanced. The smallest lymphatics, like the capillary blood-vessels, consist only of the lining membrane, which here also consists of closely-packed fusiform cells, the outlines of which can be easily demonstrated by the silvering process. According to Ludwig and Recklinghausen, each one of these vessels communicates with an irregular star-shaped vacuole of the connective tissue. Ludwig was able to inject these vacuoles, which farther communicate with one another from the lymphatics. R. found the lymphatics beginning with open mouths upon the serous membranes, and was able to follow, with the microscope, the direct absorption through them, not only of fluids and emulsions, such as milk, but also of solid powders, such as cinnabar. The absorption was frequently so rapid as to create a distinct whirl around the orifice. Chrzonzewski demonstrated, by an ingenious physiological experiment, the identity of the vacuoles, in which the lymphatics commence with the ordinary star-cells of connective tissue.

The experiment consists in tying the ureters of birds, which do not, like mammals, excrete their nitrogen, as urea, but as uric acid. The urates are then retained, and as sparingly soluble salts are soon precipitated in every part of the body. If the animal is killed a certain time afterward, every star-cell is found filled with an opaque granular mass, which may be shown by the murexide test to be uric acid. But what particularly interests us, the same granular mass may be traced through the rays of the cells into the minute lymphatics. Here, therefore,

we have the most direct transition of the endangium into connective cells. At the other extremity of the vessel a similar transition has long been known. Nearly all anatomists now agree that a lymphatic vessel on entering a follicle of a ganglion, immediately splits up lining, membrane, and all, into the connective stroma of the follicle, and that it is impossible to say at what point one begins and the other ends.

In the meshes of the sponge-like stroma thus formed, the so-called glandular elements lie closely packed, the whole mass constituting the follicle, being penetrated by a fine network of capillary vessels. The cells represent, for the most part, young, rounded, granular forms, of various sizes, and not to be distinguished from the white cells of the lymph, or from young cells generally. Besides these we almost invariably find fusiform cells, and other transition forms between the last, and the characteristic elements of connective tissue. This is particularly true of the spleen, which we must now regard as an enormous lymphatic gland. From the ultimate blending of these different kind of elements, we might at once infer that they were genetically connected, were it not for the impossibility of distinguishing the young forms of the various tissues. It is possible that we may have here connective and epithelial structures developing side by side. The permeation of the cellular elements, by a connective stroma and blood-vessels, is more characteristic of connective tissue, since it is very different from the habit of epithelial structure generally. But as this actually occurs, in at least one structure of undoubted epithelial nature, the liver, the character can not be relied on.

The generation of the lymph cells from the stellate cells of the stroma is assumed by many microscopists, and the true homology of the entire structure seems to have been more than once suspected by observers of the

first class; among others by Virchow. I translate the following passage from the most celebrated work of the great master: "I must once more call attention to the fact that the lymphatic glands differ from real glands in the ordinary sense of the term, not only in having no excretory duct, but in respect to their development. They stand by no means on the level of glands. On the contrary, their whole history assimilates them to the connective tissues, and we might be tempted to count them among those structures which arise from the metamorphosis of the connective series. But this would be at present a very bold undertaking." (Cellular Pathologie, p. 45.) To prove the homology thus hypothetically advanced, we must inquire farther into the history of the lymphatic elements. Although always regarded as secreting structures, no one has yet been able to demonstrate what they secrete. No new substance has been discovered in the lymphatics after passing through the ganglia. The constituents of the lymph are those of the serum, or rather of the nutritive plasma everywhere, and none of these constituents exhibits a marked relative increase, except fibrine, and even of this it has always been considered an open question whether it is a secretion of the structure, or whether it has passed into the lymph by diffusion from the blood. The point must however be now decided in favor of the first hypothesis. Fibrine does not pass, or passes with great difficulty, across the walls of the capillaries. We may have the most extensive dropsical effusions, we may have the blood-vessels subjected for weeks to a pressure sufficient to burst them, yet the exudation does not contain usually a trace of perfect fibrine. Wherever we find fibrine, such has not been derived from the blood, but has either been produced in situ or reached its position by open channels.

Fibrine must, therefore, be regarded as a secretion of

the lymphatic ganglia. Which of the two substances of which fibrine is now known to consist, the fibroplastic or the fibrogenic, is here secreted, or both, can not now be determined. The secretion of fibrogenic material is, however, highly characteristic of connective tissue, while it is not known to be produced by any epithelial structure. Fibroplastic material is almost equally so, but is found also in the crystalline lense, which belongs to the epithelial class.

The chief function of the lymph cells is that of serving as a matrix of the white blood-cells. Of this there can be no reasonable doubt. Indeed, if we reject the now exploded doctrine of a generatio equivoca of cells, we must either suppose these to be generated from the cells of the endangium, by direct division from the lymph cells, or in the ganglia. For the first of these methods there is no reason. The second is untenable, on account of the movement of the lymph in mass. The only fact which could militate against the third, the appearance of white cells in peripheric lymph vessels, has received an amply sufficient explanation in the recent discovery of peripheric lymph follicles in almost every part of the body. On the other hand it is confirmed by many pathological observations. Every nutritive excitement of the lymphatic ganglia causes an immediate increase of the white corpuscles of the blood, and usually a simultaneous increase of fibrine. This is notably the case in erysipelas, both the true and the phlegmonous in lymphangoitis pyæmia, etc. It is by no means as was once supposed, a general character of the inflammatory process, for there are many inflammations in which it does not occur. The most obvious connection, however, between white blood-cells and the lymphatic ganglia, is in the fatal disease leukaemia, in which the most enormous increase of white cells is found, but never unconnected with marked hypertrophy of the spleen, or lymphatic ganglia, or of both.

The lymph cells of the ganglia, and the white cells of the blood, are one and the same thing, in different situations. To prove that the white cells of the blood are connective in their nature, is to prove the same thing of the cellular elements of ganglia. This proof is given in the most striking manner in the study of thrombus. We owe very valuable observations on this point to the labors of Blandin, Lobstein, Stilling, and more recently of Billroth and O. Weber.

Very soon after the formation of a thrombus, a yellow spot appears in the centre, consisting of a cheesy mass of broken down fibrine, in which a few white cells are embedded, while the red have completely disappeared. The superficial resemblance of this mass to pus, led to the famous phlebitis theory of Cruveilhier. A little later, the detritus has in a great measure disappeared, and become replaced by numerous white cells, which might easily be taken for pus, even under the microscope. But they are not pus, as their subsequent metamorphosis proves. Virchow was at one time inclined to consider these cells as only the white cells remaining after the absorption or disintegration of the red, and to suppose that they were undergoing degeneration. But they are far too numerous, and frequently fill up nearly the whole space originally occupied by the thrombus. Their origin, by direct multiplication of the original white cells, has moreover been now distinctly observed. The next stage is the transformation of these same cells into connective tissue. The individual cells elongate, become fusiform, and ultimately send out anastomosing rays, while an indistinctly fibrillated cement makes its appearance. During the whole of these transformations, the mass is completely separated from any organized structure by a layer of coagulum, which gets thinner and thinner, and ultimately disappears. True to the law of connective tissue, blood-vessels

soon make their appearance, and are at first perfectly distinct from the vasa vasorum, with which they subsequently freely communicate. Whether the first red cells which these vessels contain are formed in situ, or are derived from the general circulation, has not been definitely made out, but the first is, for several reasons, more than probable. When the process is complete, the walls of the vessel, the endangium, and the thrombus form one mass of connective tissue, and the vessel is completely and permanently obliterated.

These observations, if correct, render the homology of the cells of the lymphatic ganglia, and the white blood-cells with the connective series unassailable. They are moreover interesting as exhibiting what slight causes may cause one and the same cell to assume two very distinct anatomical forms. For the development of lymph cells into fibrous structure is not the only transformation they can undergo, nor indeed the normal one. Physiologically the lymph cells are the young forms of the red blood cells. This idea, although even now not universally admitted, has been steadily gaining ground for the last ten years, and for the following very good reasons: The red cells, being devoid of nuclei, are incapable of multiplication. This is borne out by direct observation, for no one has ever seen a red blood cell in process of division, which, if it occurred, could not have escaped attention in the innumerable microscopic examinations of blood, made in almost every part of the world, more especially, as it is easily demonstrated, in the blood of the embryo, previous to the appearance of the liver and spleen, when the red cells are still nucleated. Either, therefore, the red cells are permanent structures, or they are produced from other cells. It can, however, be easily demonstrated that there must be a constant production of blood cells during the whole period of existence. In the first place, the mass of

blood, and consequently the number of blood cells, increases directly with the weight of the body. Farther, the most excessive losses of blood cells from hemorrhage and other causes, are repaired within a few days. Lehmann has demonstrated a very considerable decrease in the number of red cells in the blood of the hepatic vein, and the complete identity of the bile pigment and hematoidine, the well known substance into which the coloring matter of the blood is transformed, whenever it is anywhere in the body removed from the cells, is strong evidence of the truth of his assertion. Brown Sequard injected the eliptical blood cells of birds into the vessels of rabbits, and observed that they could be found for several days performing the same functions as other blood cells, but then disappeared.

For these and other reasons, we must admit that there is a constant destruction and reproduction of red blood cells going on during the whole period of existence, and since they can not produce their kind, like other cells, and an autochthonous production of cells is no longer admissible in physiology, they must owe their origin to other cells. There is no reason why these should not be the white cells, which are poured into the circulation in such numbers and from so many sources. The splenic blood alone contains ten times as many white cells as ordinary venous blood, namely, one white for every fifty red. If, therefore, an amount of blood, equal to that of the entire circulation, should pass fifty times through the spleen, a number of white cells would be added to it sufficient to reproduce the entire number of red cells. From all we know of the velocity of the circulation, very few days would suffice for this. What then becomes of this immense number of young cells thus continuously poured into the circulation? That they are immediately destroyed without undergoing any transformation into

riper forms is contrary to all physiological analogy, yet no transformation of these structures, other than into red cells, has ever been observed under normal conditions. On the other hand, the direct evolution of red cells out of white, may be directly observed in almost every specimen of splenic blood, and frequently in the thoracic duct. The cell contracts, becomes clearer, while the nucleus becomes granular, and ultimately disappears. The cell then gradually fills with coloring matter, and becoming flattened and biconcave, exhibits all the characters of the perfect blood cell.

The origin of the red blood cells, therefore, clearly connects them with the connective series, but it must be confessed that the genetic connection is almost the only fact which points unequivocally in this direction. Their deciduous nature, and their secreting so highly specialized a product as haemato-crystalline, would indicate epithelial characters. Perhaps the valuable discovery of Alexander Schmidt, that the contents of the blood cells are fibroplastic, that is, contain one of the proteine bodies which are now known to form fibrine when made to react on one another, might be considered as additional evidence, were it not that the same substance occurs in the crystalline lense, a structure of undoubted epithelial character.

The physiological and pathological transformations which, next to their origin, furnish, as we have seen, the most valuable clue for determining the homologies of the cellular elements, are entirely wanting in the red blood cells. Never, under any circumstances, has a transformation into any other kind of structure been observed. A red blood cell, whether in or out of the circulation, is doomed to inevitable destruction. This peculiarity is probably due to the absence of the nucleus, for only young forms can undergo organic metamorphosis, and cells lose the power of generating their species with their nuclei.

The homology of the red blood cells, therefore, with the connective series, although from their origin, more than probable, can not be demonstrated with the same degree of certainty as for the other structures we have examined; but it would be far more difficult to exhibit as close a connection with any other structure in the body.

The views above advanced in regard to the lymphatic cells, are fully borne out by pathological observation. Hypertrophy of the lymph ganglia leads, not to a massive accumulation of cells, but to induration with the production of inodular tissue or a cheesy degeneration unknown in epithelial structures. All the morbid growths, peculiar to connective structures, are found arising from lymphatic ganglia, which might indeed be owing to the fibrous stroma, but on the other hand, those which are especially characteristic of epithelium are wanting. None of the forms of epithelium are primarily formed in lymphatic ganglia, and although possessing a distinct follicular structure, these never produce true cysts.

No transformation of the white cells after leaving their matrix has been observed, except those already mentioned into red blood cells and areolar tissue; but attention has been already called by Uhle and Wagner (Handbuch d. allgemeinen Pathologie, p. 203) to the probability of their giving rise to many varieties of morbid growth, when arrested in a thrombus or extravasation. This, if ever demonstrated, would throw much light on the now inexplicable metastases of many morbid growths.

Although the evidence adduced in favor of the homology of the serous-lymph and blood cells with the great series of connective cells, does not possess that degree of accuracy at present necessary to establish a scientific fact, or to raise the doctrine put forward above the rank of a mere hypothesis to be sustained or refuted

by more extended observation than the science now possesses, yet it is claimed, that it renders ripe for discussion the following important theses:

The distinction traced at an early period of the embryo between the connective and epithelial series of cells by the division of its germinal layers, is maintained throughout the whole of its subsequent evolution and through the whole range of pathology.

Epithelium is derived only from epithelium, and connective structure only from connective. The members of either group may be transformed one into the other, but never can one of the connective series be converted into epithelium, or connective cells be evolved from epithelial.

Protoxide of Nitrogen, $NO. NH_3, NO_5 = 3\,HO + 2\,NO$.
By J. P. H. Brown, Dentist, Augusta.

Protoxide of nitrogen, nitrous oxide, or laughing gas, was discovered in 1776, by Dr. Priestley; but its anæsthetic properties were not known until after the researches of Sir Humphrey Davy, in 1800, who then made use of the following language: "As nitrous oxide in its extensive operations seems capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place."

This prediction of Davy, it seems, was not fulfilled until 1844, when Dr. Horace Wells, a dentist of Hartford, Conn., conceived the idea of using this agent to relieve the pain in extracting teeth. To test the matter, he inhaled the gas himself and had one of his own teeth extracted. He was so impressed with the success of the gas as an anæsthetic, that he endeavored to introduce it into surgical practice. In 1847 he succeeded in getting Dr. E. E. Marcy, of Hartford, to allow him to administer the gas during an operation of removing a scirrhous testicle;

and in 1848 Dr. P. W. Ellsworth, of the same place, performed an amputation of a thigh on a boy. In this case Dr. Ellsworth remarks, that the gas was administered "with a success fully equal to that attained since, either by ether or chloroform." Shortly after this operation, Dr. S. B. Beresford removed an adipose tumor, six ounces in weight, from the shoulder of an adult.

After these operations, nitrous oxide was abandoned in surgical practice, until Professor Carnochan introduced it again in 1855. This eminent surgeon, in the *Medical and Surgical Reporter* for February 10, 1866, says: "Since my letter in December, I have performed four more capital operations on adults, viz.: one amputation of the thigh, one of the leg, the removal of a tumor from the side, and the extraction of a cataract, making in all, since last July, seven successful capital operations under the influence of anæsthesia produced by the nitrous oxide. I have also during this time used chloroform and ether in many operations, and my opinion in regard to the superiority of the nitrous oxide as an anæsthetic is still unchanged."

Since last September the writer has administered the gas some eighty odd times during operations of extracting teeth, with perfectly satisfactory results. As the effects from one administration seldom last longer than two or three minutes, it requires rapid operating when there is much work to be done. This briefness of its effects makes it not so desirable for operations in the mouth where there is much hemorrhage, particularly in the extraction of roots on the lower maxillary. In the practice of the general surgeon these difficulties can more easily be overcome. By alternating the inhalations of the gas with those of atmospheric air, patients have been kept under its influence for sixteen minutes. In one case for thirty-two minutes, with no bad effects.*

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* Report of Society of Dental Surgeons of the City of New York, in *Dental Cosmos* for March, 1867.

The *modus operandi* of nitrous oxide in the production of anæsthesia, is not well understood. It is supposed to produce insensibility by its rapid stimulating properties, which overcome systemic excitability and cause the partial interruption of vital activity. "This power of nitrous oxide," remarks Dr. Ziegler in his Researches on Nitrous Oxide, "to produce anæsthesia by superoxidation, overstimulation, etc., is quite distinct from that of all other agents, more especially of the hydro-carbonaceous variety; for they induce the anæsthetic condition by non-oxidation and deoxidation of the system, and by directly checking chemico-organic reaction and annihilating sensibility and consciousness. The former, therefore, increases while the latter diminishes life action, with, in both instances, the same general result of insensibility of body and unconsciousness of mind, though relatively as different in character from each other as sleep is from stupor, or satiety from starvation."

When the effects of nitrous oxide pass off the system, there is none of that feeling of nausea and lassitude which usually attends the administration of chloroform and ether. This may be accounted for by the fact that the former agent increases the amount of oxygen in the blood, while the latter agents diminish it.

While I am not aware of a *well-authenticated* case of death from its use (though several *reputed* ones have been reported), I am free to admit that injury may be occasioned by its injudicious or excessive administration.

It can not be supposed that an agent capable of producing by its inhalation, in a few minutes, an anæsthetic condition of the system, can be *so harmless* as to be intrusted to the ignorant, and administered indiscriminately. In the first place, the gas must be pure. In order to have it so, it is not only necessary to have pure chemicals and a complete apparatus for its generation, but chemical

knowledge and the utmost care are required in its preparation, otherwise noxious gases may pass over with the nitrous oxide, rendering it impure and injurious to inhale.

The use of nitrous oxide is improper in certain conditions of the system, as, for instance, where the lungs are seriously diseased; where there is organic disease of the heart; where there is a predisposition to cerebral congestion; and where the brain is diseased or any way unhealthy.

Ligation of the Axillary Artery. By J. B. BAXLEY, M.D., of Richmond County, Ga., late Surgeon P. A. C. S.

Private J. W. Gomer, company B, twenty-fourth S. C. volunteers, received a gun-shot wound of the left arm on the 20th July, 1864, and was admitted into third Georgia Hospital, Augusta, Ga., on the same day. It was a flesh wound, a minnie ball having traversed the soft parts near the junction of the middle and upper thirds of the arm, internally to the humerus.

On the 29th of July, hospital gangrene, which had been prevalent in the hospital, invaded this wound, producing extensive sloughing in its vicinity, with great tumefaction of the entire limb, and a rapidly exhausting constitutional irritation.

On August 4th, the brachial artery sloughed, causing profuse secondary hemorrhage, whereupon the axillary artery was tied where it is embraced by the two heads of the median nerve. It was deemed impracticable to ligate at the point of injury on account of the local disorganization of the tissues, hence the selection of the nearest practicable point above it—the axillary region.

It is interesting to observe the result: on the third day afterward the large slough separated, leaving a healthy granulating surface, and in five or six days the swelling

of the limb had entirely subsided. The wound healed rapidly, and in due time the ligature came away. The patient was furloughed August 24th.

To hasten the separation of the dead tissues, a caustic solution of sulphate of copper was used; the general treatment was mur. tr. iron, thirty drops, three times daily, with brandy and a generous diet.

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*A Paper on the Employment of Mercury in Cholera, Dysentery, and Diarrhœa, and upon the Question of its Action upon the Liver.** Read before the Morgan County Medical Society, by DAVID PRINCE, M.D., of Jacksonville, Illinois, and communicated for the St. Louis *Medical Reporter.*

RESULTS OF EXPERIENCE.

1. Mercury is found by experience to produce changes in the function of the alimentary canal in health, increasing the amount of liquids expelled, and changing the color, apparently in consequence of the combination of mercury with sulphur, producing a sulphide or sulphuret of mercury of a green color.

2. Mercury is found by experience to change the action of the alimentary canal in watery diarrhœa, so as to diminish or suspend the watery flow, and to suspend the symptoms which attend the inordinate effusion of fluid.

3. The conditions which most indicate the employment of mercury are those of acute and exhausting fluxes, most frequently occurring in hot weather, as cholera infantum in children, and cholera morbus in adults.

4. The power of mercury to correct other forms of intestinal derangements, especially those supposed to be attendant upon sluggish or obstructed portal circulation, is certainly established by experience, irrespective of any theory of its mode operating.

5. Experience establishes that, for the purpose of correcting intestinal derangements, mercury has more efficacy in acute attacks than in chronic states, in which

* This paper attempts to present a resume of the correct literature upon the question of the action of mercury upon the liver, more than to produce anything original.

inflammation has become established in some portion of the mucous membrane.

THEORY.

If these propositions as to the employment of mercury in diarrhœal affections are correct, it follows that the effects are to be explained by supposing an influence produced upon the mucous membrane and the various glands connected with the alimentary apparatus, and not by a change effected in the composition of the blood.

This does not imply that the medicine may not, in whole or in part, be absorbed, and be carried into the circulation; but that if so, the action determines upon the organs where experience shows that the medicine directs its agency.

The local irritation indicated by pain, tormina, and inverted action of the duodenum, with entrance of bile into the stomach and its ejection by the mouth, is best explained by supposing a local action independent of absorption into the general circulation; and this supposition may help to explain the different effects of small and frequent doses, from those which follow the administration of large doses. In the one case a milder influence, more widely spread, might be expected; in the other, a stronger local impression, confined chiefly to the portion of the tube in which it is travelling along. This theory helps to explain why, in cholera infantum, a fourth of a grain of calomel, frequently repeated, may be more efficacious in correcting the condition of the mucous membrane than five grains given at once.

The passage of the medicine through the portal circulation necessarily carries it through the liver in its course to the general circulation; but this constitutes no more reason why mercury should be a special stimulant of the liver than holds for the salts of magnesia.

The detection of a larger amount of mercury in the liver in experiments upon animals than can be found elsewhere in the body would not prove that mercury is a special stimulant of the secretion of bile, but only that it lodged there for the time in greater quantity than could be found elsewhere. The probability of a portion of mercury being carried in the bile back to the duodenum, to be again absorbed and returned to the liver, might stand as a theoretic reason for a greater proportion of

mercury being found in the liver for a considerable time after the administration of it.

The question of the power of mercury to increase the flow of the bile rests entirely on the results of experiments, and not upon the observed effects of mercury in intestinal derangements.

If it could be proved that mercury is not at all a cholagogue, except as to emptying the gall bladder by the perturbed movements that are connected with vomiting, the place which mercury holds in therapeutics, as built upon observation, would not be disturbed.

Those uses of mercury which are inferred from the theory that mercury increases the flow of bile, should be abandoned, however, unless it can be established that the secretion of bile is increased under the administration of this agent.

In this connection it may be stated that the vomiting of bile in connection with the action of a full dose of calomel or blue mass is no evidence whatever of an increase of the secretion of bile, but only of the expulsion through an unnatural channel of that already secreted and accumulated in the bile ducts, or lodged in the gall bladder. No clinical observations can possibly settle the question; for several pints of bile are supposed to be produced every day, to be again reabsorbed, after having performed its part in rendering food and medicine capable of absorption. The loss by vomiting, or by brisk purging, of a pint or more of this profuse production, would be no evidence of its more rapid formation.

Experiments upon animals prove that the amount of bile produced varies with the amount and kind of food, very much as the salivary glands obey the stimulants applied to the mucous membrane of the mouth.

Not many conclusive experiments have been performed to determine the quantity of bile which flows, and the influence of various agents in increasing or diminishing it.

Much attention has been attracted by a series of experiments performed in 1858, by Dr. George Scott, in the laboratory of Dr. Lionel Beale, in London.

A fistula was made between the skin and the fundus of the gall bladder of a dog, after having tied the common

duct so as to shut off all flow of bile into the duodenum.* The dog maintained an appetite, but grew lean.

Four experiments were made with calomel, with diminution each time of the fluid bile, and of the solids secreted.

Three grains of calomel were given on the 13th of June. The daily average of bile for two days previous had been one thousand nine hundred and sixty grains of fluid bile, one hundred and four of bile solids, and thirty-two of bile acids. The daily average for two days after the medicine, one thousand three hundred and fifty-eight grains of fluid bile, seventy of solids, and twenty-six of bile acids. The calomel in this case reduced the fluid bile and the bile solids one third, and the bile acids one fifth.

A second dose of six grains of calomel was given on the 16th of June, with a diminution of fluid bile two thirds, the solids one third, and the bile acids one sixth.

The third dose, of ten grains, was given on the 3d of July, with diminution of fluids and solids, but with increase of bile acids.

The fourth dose, of twelve grains, was given on the 7th of July, with reduction of fluid bile from two thousand six hundred and fifty-eight to one thousand seven hundred and twenty-four grains, the bile solids from one hundred and seventeen to eighty-five grains, and the bile acids from fifty-four to forty-five grains.

These experiments tend to overthrow the commonly received theory that mercury increases the amount of bile secreted, carrying with it those therapeutic indications based upon this theory, without, however, disturbing those uses of mercury based simply upon observation.

Dr. Brown, in the article from which the account of these experiments have been taken, quotes Dr. Scott as referring to three experiments of Köliker, in which calomel was given to a dog, and in two of which there was a diminution of the amount of bile secreted; and to Dr. Thadicum, who in some remarks upon this subject, before the Medical Society of London, states that in Vol. XIII of Virchow's Archives, are some experiments by Masler, proving that mercury does not make its appearance in the bile, nor increase the quantity secreted, even when given

* Trans. New York State Medical Society, 1864, p. 267; article by James L. Brown, M.D., quoting from No. 3 Archives of Medicine, by Dr. Lionel Beale.

in very large doses, from twenty-two to fifty-two grains. Dr. Thadicum also alludes to some experiments by H. Nösse, and by H. Müller, in which it was found that the addition of calomel to food, which under ordinary circumstances produced a certain normal quantity of bile in dogs, diminished the amount secreted.

It may be claimed that the action of mercury upon healthy dogs can not settle its action upon diseased men; that while the amount of bile produced in a healthy dog may be diminished, the amount may be increased in a sick man. No direct experiment can be made to meet this point, but the analogy of cathartics, diuretics, and diaphoretics leads us to conclude that the action of medicinal agents upon healthy organs afford a strong presumption of their action in morbid states, and with some exceptional medicinal agents, that they are found to have similar effects upon man and the lower animals.

There is a surprising want of reference to the liver in the descriptions given of the results of mercurial action. The salivary glands and adjacent parts, and the intestinal canal, give signs of irritation, but the liver not.

In this connection it is proper to quote, on the other hand, the explanation suggested by Headland, in "Action of Medicine," p. 322, fourth American edition. Referring to the influence of over-stimulation of a gland to produce congestion, and a suspension of its proper function, he says: "Cantharides and turpentine increase the urine when taken in moderate doses, but when in over doses they diminish it, and may cause painful strangury, with an almost total suspension of the secretion. The explanation of such an action is obvious. Congestion is caused by the excessive action. In the same way we find that a large dose of mercury, naturally a cholagogue, may produce jaundice, by causing congestion of the liver. This fact has been observed by Dr. Graves, of Dublin. But it does not follow from this, as argued by Dr. H. Jones, that mercury rightly administered does not increase the secretion of bile, and stimulate the hepatic function."

It is hardly necessary to quote the experiment of Dr. Beaumont, who gave his man twelve grains of calomel, causing "commotion," "slight nausea," and "the secretion of a white, frothy fluid, running from the aperture like fermenting beer from a bottle."

The generally received opinion of medical men with regard to the action of mercury, is expressed in the United

States Dispensatory: "In functional derangement of the digestive organs, mercurials in minute doses often exert a salutary operation, subverting the morbid action, and that, too, by their slow alterative effect, without affecting the mouth. In these cases no decided disturbance of the vital functions takes place, but the alvine discharges, if clay colored, are generally restored to their natural hue, a certain proof that the remedy is stimulating the liver, and promoting the secretion of bile. Indeed, there is no fact better established in medicine than the influence of the mercurial preparations over the hepatic system, and whether the liver be torpid and obstructed, as in jaundice, or pouring out a redundancy of morbid bile, as in melœna, its judicious use seems equally efficacious in unloading the viscus, or restoring its secretion to a healthy state."

The question involved is, whether mercurial preparations may not aid in the production of stools having the color attributed to bile, but whether the effect comes through any influence upon the liver, or through the presence of bile.

A case in point is one which occurred under the observation of Dr. J. Hughes Bennett, of Edinburg, of impaction of a gall stone in the common biliary duct. A deep jaundice existed, with dark urine, and the patient gradually declined, though brown stools were secured. Four days before death the stools were described as being green and dark. On the post mortem the common duct was found completely obstructed, and the biliary ducts greatly dilated.*

Dr. Inman states that he has seen many cases of suppression of bile, in which the feces maintained their natural color; and, on the other hand, cases in which the stools acquired a clay color without any hepatic derangement.

Dr. Ward (*British Medical Journal*, 1860) had himself a diarrhœa lasting six months, with clay colored stools, without any other evidence of bilious derangement.

Dr. Inman states that the green color of calomel stools is owing to to the sub-sulphide of mercury, as the black color of the stools incident to taking preparations of iron is owing to sub-sulphide of iron, and that there is no evidence derived from chemical tests that calomel stools

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* "Clinical Lectures on the Principles of Medicine," by J. Hughes Bennett.

contain any bile whatever, not even any of its coloring matter.

Dr. Inman maintains that fecification begins in the colon, and that it is in the colon that the brown color begins, and that the inference is that the color is the result of a secretion from the colon. A clayey diarrhœa in this light demonstrates that the colon and not the liver is sluggish.

Dr. Russell, of Birmingham, confirms the same theory of the color of the feces.

The fact is referred to, that a diet continuously of bread and milk produces a clayey color of the stools.

The inference from all this is, that the agency of the bile (if it has any) in the production of the color of the feces, is through some stimulation it produces upon the intestinal secretion, rather than through any material which it directly furnishes.

It has been ascertained in further elucidation of this subject, that the tests relied upon for detecting the coloring matter of the bile, secure the same reaction with the coloring matter of the blood, where this is in a state of disintegration, as in ecchymoses, presenting all shades of color successively from deep brown, through green and yellow, to the natural hue of the tissues.*

The inference from this is, that the coloring matter of bile is hematoidine, the disintegrating hematine which gives color to the blood. According to this theory, jaundice is the retention in the blood of effete coloring matter, which ought to be chiefly eliminated by the liver, to be finally decomposed in the intestine, so as no longer to be recognized by chemical tests.

If now it is found that calomel fails to secure a more abundant secretion of bile, it will no longer be given for the cure of jaundice, which, according to this theory, is for the most part a result of the failure of the liver to separate from the blood its coloring matter. It may be mentioned in passing, however, that the jaundice of yellow fever, and the icteric hue, resulting from bruises, and the general sallow color after great losses of blood, can hardly have any relation whatever to the function of the liver.

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* See Prize Essay by Dr. S. Fleet Spier, in transactions of American Medical Association, for 1864.

With regard to the color of the feces, Mr. Inman propounds this question: "Did ever any one see the contents of the small intestine brown, deep yellow, or of a bilious color? Did ever any one see, in cases of hernia, a brown fecal matter flow from the bowel, if the small intestine only was implicated? It is not a fact that the intestinal fluid is always whitish prior to its reaching the ileo-cæcal valve, and that it obtains its fecal character and color in the colon."

In view of these considerations, what must be the mode in which mercury favors a restoration of the brown color of the feces?

1st. It may produce a green color by its own combination with sulphur, which can be washed out and detected by chemical tests.

2d. It increases the amount and changes the character of the secretion of the intestinal glands, thus tending to correct the perverted functions of the passage.

It is now easy to see how careful observers may have been misled, to think that they procured a flow of bile by the administration of mercury. Thus, at the last meeting, Dr. Cassell stated that in the treatment of cholera in 1833, he was sure of the safety of the patients when, by the administration of calomel, he procured bilious stools. In this connection, Dr. Reed stated that a case occurred about the same time under his observation in which no mercury was given, but opium, capsicum, and camphor, without cathartics of any kind, and the patient recovered with this phenomenon. The first fecal evacuation, which was a consistent one, was clay colored in its lower half and brown in its upper half.

The inference from this fact is that the contents of the intestine remaining at the cessation of the cholera-flux retained its color, and that the material secreted from the intestinal glands afterward had the characteristic brown color, communicating the hue to whatever there might be of insoluble ingesta.

The fact, then, of the safety of the patient on the occurrence of *bilious* stools has a reversed explanation. The color comes in the stools, because the patient is beginning to get well. The stools thus contribute a most valuable aid in prognosis, and they will continue to be examined with as much interest as though the action of the liver were supposed to be the turning point in the progress of the case.

The changes which take place in the insoluble forms of mercury, as the metallic mercury rubbed into fine particles as in blue mass; oxide of mercury in ointment and calomel; to enable them to enter into the circulation, are not well understood; but the fact that they become dissolved is certain, if we admit the doctrine that only substances in solution can enter the circulation, for the presence of mercury is discovered in distant parts, to which it can only be carried by the blood.

Miahle maintained that mercury became soluble by being invariably converted into bichloride, so that this substance might, by proper management, be substituted for the other forms with the same results.

Headland claims that though this may be one of the ways that mercury gets into the system, it is probably not the usual mode.

According to this authority the bile acids form direct combinations with oxide of mercury, and the saliva and the mucous secretions of the intestinal canal take it up with promptness.

We are now prepared to appreciate the different results which may be obtained by varying the size of the dose of mercury, and the frequency of repetition.

Where corrosive sublimate is given the immediate local irritation which attends the contact of the agent, except in a very dilute form, renders the importance of minuteness of dose obvious enough.

Calomel, however, is dissolved slowly, so that a large dose may fail to secure any great degree of irritation, and the medicine may be in part expelled unaltered in the feces. There is always a risk, however, that a large dose may be retained until its complete solution and absorption may produce unwelcome results, either upon the mucous membrane or upon the general system, through its aplastic influence upon the blood or its determination to the salivary glands.

Headland remarks that "Very much smaller doses of calomel and blue pill than are usually given, will produce very much the same effects, because sufficient to exhaust the solvent power of the system. Thus, Dr. Law has shown that one twelfth of a grain of blue pill, given every hour for twenty-four hours, will produce salivation."

The efficacy of small and frequently repeated doses of calomel in cholera gets its most plausible explanation in this way: whether the medicine may be supposed to act

first locally, or by being first absorbed and again determined upon the intestinal surfaces, as its way of getting out of the system.

I am myself indebted to Dr. Henry Jones, of this place, for a knowledge of the efficacy of small doses of calomel, from one fourth to half a grain, every ten, twenty, thirty, or sixty minutes in cholera infantum.

The grinding of calomel with crystallized sugar may be regarded as a preparation of some importance, as the medicine must be more readily dissolved by the chemical agents it meet with in fine powder than in coarse. The sugar also gives the medicine a taste agreeable to a child.

The purpose of this paper has been to stimulate inquiry and discussion rather than to settle any questions. For this purpose I have stated the grounds of the new doctrine with more fullness than those of the old, with which all are supposed to be familiar.

The new idea is not intended to revolutionize the employment of mercury, but to limit its employment to the uses established by observation, and to abolish the administration of the powerful agent in the cases in which it is inferred that the liver is too sluggish or too active, needing this regulator.

That an immense amount of harm has resulted from this theory of the control of the function of the liver by mercury is plain to every man of observation.

Comparative Merits of Incision and Dilatation of the Mouth of the Womb in cases of Dysmenorrhœa, etc. By D. HUMPHREYS STORER, M.D. Read before the Boston Society for Medical Improvement, August 27th, 1866.

Every member of this Society must have often been impressed with the tendency which exists in the profession to be unduly influenced, I might, perhaps, with propriety, say *overawed*, by the opinion of those who have attained a commanding position in our ranks. This tendency I consider an exceedingly unfortunate one—it destroys self-reliance, individuality; it prevents the physician from faithfully performing his duty, inasmuch as he yields his dearly-bought and invaluable experience to the decided, oracular dicta of others. However much we should value and endeavor to profit by the instructions of

our fellow-laborers, we should never be willing to relinquish our own convictions, unless satisfied we are in error; until it is clearly shown that the course we have pursued, and are still pursuing, is erroneous. These thoughts have been suggested by the following circumstance. Since our last meeting a gentleman called upon me with his wife, who desired my professional advice. She had been an invalid for some length of time, complaining more particularly of dysmenorrhœa. I carefully examined her condition, and found she had a retroflexion of the uterus, the body of the organ being so completely bent upon the commencement of the neck as to cause almost a complete obstruction of the cervical canal—admitting the passage only of a very small metallic dilator. I told the husband what derangement existed, and the course which should be pursued to remove it; that I should advise the introduction of sponge-tents to produce dilatation, and, when this should be accomplished, the wearing of a stem pessory until the distortion should be permanently overcome. He at once told me that Dr. ——, who had seen his wife, stated that the plan I now suggested would *formerly* have been pursued—that it was not now, however, practiced by the profession, but that *incision of the neck* was the only approved method.

As the physician referred to has been a practitioner for quite a number of years, and consequently must have seen a greater or less number of cases similar to the one now spoken of, he evidently, in this instance, tacitly yielded his opinion to the *weight of authority*.

I think he must have read an article on "Dysmenorrhœa, Metrorrhagia, Ovaritis, and Sterility, depending upon a peculiar formation of the Cervix Uteri, and the Treatment by Dilatation or Division," which was published in the last volume of the *Transactions of the Obstetrical Society of London*, by Robert Barnes, M.D., President of the Society, and also that he must have coincided with the remark of Dr. Marion Simms, made at the meeting at which that communication was presented, "that that Society must be taken as the representative of professional opinion on any subject falling within its domain." Now, however willing we may be to admit the value of the transactions referred to, we are unwilling to allow the infallibility of any, even of the *most distinguished* of that Society. And even at the meeting referred to, it was evident that no little diversity of opinion existed between

Drs. Barnes, Baker, Brown, Greenhalgh, Routh, Savage, Hewit, Wyner, Williams, and Sims, as to the location of the obstruction in dysmenorrhœa, and the local treatment, whether by dilatation or division.

Thus Dr. Barnes considers the "seat of the obstruction," to use his own words, "almost invariably at the os externum. The obstruction is due chiefly to the small, round os itself; partly to the pointed, elongated form of the lower part of the vaginal portion, and partly to an unusual rigidity of structure of this part, which impedes the expanding action natural to the healthy formed os uteri."

Mr. Baker Brown, on the contrary, differed from Dr. Barnes as to the seat of the stricture; he believed it to be in the cervix itself, generally accompanied by narrowing, contortions, and reflexion of this canal—the results of inflammation.

Dr. Greenhalgh considered, from a long experience, that in a great majority of cases the stricture exists at the internal os uteri.

Dr. Routh coincided with Dr. Greenhalgh.

How utterly absurd to allow our judgments upon this point to be swayed by the opinions of either of the gentlemen above quoted, when the experience of every week assures us that the obstruction referred to may, and *does* exist at any point from the outer to the inner os uteri.

But especial reference I would make as to the manner of *overcoming this obstruction*, wherever it may exist.

Drs. Barnes, Baker Brown, Greenhalgh, and Simms strongly advocated the employment of the metrotome, or hysterotome; that a free incision be made; and Dr. Greenhalgh urged that the internal os should be dilated as well as the external os.

In other words, after the profession have for a series of years considered that, in the vast majority of cases, a contracted, an almost impervious os and cervix uteri may be dilated, and in many instances the suffering produced by this impediment removed by the employment of metallic dilators or sponge-tents, we are told by the President of the Society referred to, that "incision is now considered as not only justifiable, but as the only efficient and permanent remedy for dysmenorrhœa." Mr. Baker Brown, Drs. Greenhalgh, Routh, and Simms appear to have coincided with this view of the subject.

And why is this plan so strongly advocated? Dr. Barnes says: "Hemorrhage, pyæmia, cellulitis, peritonitis, have undoubtedly followed dilatation; and it is certain that in many cases, however good the dilatation effected by bougies or tents may appear at first, it is not of long duration. I suppose there is no dilatation by instruments more powerful than that effected by pregnancy and labor, yet after giving passage to a full-grown child, the peculiar cervix will sometimes completely resume its old vicious form."

Mr. Baker Brown agreed with Dr. Barnes, that "dilatation was an inefficient and only temporary remedy for dysmenorrhœa arising from the stricture of the canal."

Dr. Routh "had seen cellular abscess and death follow the use of sponge-tents."

We remember having seen, in some New York journal, a year or two since, similar remarks to have been made by Dr. Fordyce Barker and others respecting the employment of sponge-tents; that they had seen injurious results produced by their employment. It would be presumptuous in the extreme for me to doubt the statements of these gentlemen; I believe they stated the truth; I allow all they utter *may* occur. But is any known remedy *always* reliable? Is any known operation always successful? Is not an invalid sometimes *made the sicker* by the dose administered? the suffering one made *permanently* a sufferer by the surgeon's knife? May not some of the evils thus produced by sponge-tents be unnecessary? May not the time at which they are introduced, the size of the tent, the manner of its introduction, influence the effects produced? Not unfrequently, particularly in hospitals, this operation would be advised by the attending physician, but be performed by a less skillful hand, even by a nurse. Should there be an unusual excitement of the parts, such as frequently exists just preceding or following a menstrual period, it would of course be contra-indicated. The size of the tent is of great importance. We can readily conceive that a large tent, which is capable of being dilated to a great extent, should cause much distress at the moment of introduction, and produce long continued and serious constitutional derangement. The operation itself may be improperly performed. If, instead of being carefully introduced, and the effects produced being watched, the dilator is carelessly, roughly, unfeelingly forced into the sensitive parts, suffering to a greater

or less extent must inevitably be produced. This is self-evident. From a somewhat extensive employment of sponge-tents during the past ten years for the treatment of dysmenorrhœa and sterility, I have formed conclusions different from those of the gentlemen of whom I have spoken. I have not unfrequently been disappointed in the result hoped for. The local obstruction has almost always been overcome by the long-continued, persevering employment of the dilator; but the opened canal does not always remove the condition thought to depend upon its closure —dysmenorrhœa and sterility still remain. I have, however, never seen the ill effects spoken of from the employment of tents. I can not recall a single instance where more than a few hours inconvenience have been produced; and in such cases the expanded sponge, when removed, has proved to have been originally much larger than was supposed to be—showing that he who employs these tents should be acquainted with their uncompressed dimensions. My experience has taught me, then, that these contractions, however firm they may be, may almost invariably be overcome. The physician need not feel that the part is undilatable because the application of three, or five, or half a dozen tents does not overcome it; in a case occurring in my practice about a year since, *eighteen* sponge-tents were introduced at intervals of two and three days before the canal was opened. My perseverance was rewarded by the perfect relief of the patient. I could point, were it necessary, to several cases where, after years of sterility, the sufferer has been relieved and borne children, and in the intervals in childbearing have suffered no dysmenorrhœa. I have repeatedly seen cases of dysmenorrhœa relieved for years, and known no return. In a word, I have relied upon dilatation to relieve these affections, and whatever opinions may be advanced by others, so long as I feel we have a remedy from which we can confidently expect relief, and very rarely observe any injurious effects, I shall feel it my duty to employ it.

That cases do occur where the difficulty *can not* be removed by dilatation, there can be no question; but "that incision is the only efficient and permanent remedy (in most cases) for dysmenorrhœa," I unhesitatingly deny.

Let us for a moment look at the method proposed. Those who advocate it should of course be satisfied that it has superior claims over the means now employed. I

have thought the ill effects produced by *distension* might be occasioned by want of care; but those arising from incision *may* follow the operation of the most skillful surgeon who advises it, when the metrotome cuts through the walls of the inner os; and Dr. Barnes states, to employ his own language, "there is no doubt that the surgeon has actually cut through the substance of the uterus, and wounded the plexus of vessels outside; hence, severe and dangerous hemorrhage has ensued, and the inflammation of the periuterine tissues." And even supposing the operation should be successfully performed, it is acknowledged by Dr. Routh, one of its advocates, "that such an amount of contraction frequently exists as to render it necessary to have a dilating substance worn for a considerable length of time to prevent its perfect occlusion;" and Dr. Williams observes that "oftentimes no relief is afforded. He had seen a patient whose cervix uteri had been slit up on both sides, forming two large protruding lips, without affording any relief to the sufferer." Where the external os has been almost cartilaginous to the feel, I have overcome the obstruction with the hysterotome; but I have never attempted to divide the internal os. I can not, however, recall the instance where it was required.

Fortunately for those who object to unnecessarily experimenting upon the os and cervix uteri, there were those at the meeting when Dr. Barnes read his paper, whose opinions coincide with ours upon this subject. Thus, Dr. Savage, physician to the Samaritan Hospital for Women, who was in the habit of treating the severest cases of the character I have spoken of every week, assures us he never failed to remove the obstruction with the sponge-tent; and Dr. Graily Hewitt observed that where the cervix uteri was not hard and tense, he preferred to employ the tents as dilators. With these opinions Dr. Williams also coincided.

Enough has been said, I trust, to prove that the profession generally do not advocate the indiscriminate incision of the cervix uteri in cases of dysmenorrhœa; that the physician should yield his scientific opinion only when convinced of its error; that carefully attested facts are of infinitely more value than the dogmatic teachings of the highest authority.—*Boston Medical and Surgical Journal.*

Monthly Period of Infecundity.

We have received from Dr. Avrard, a physician at Rochelle, an interesting little work, printed at Bordeaux, by Gounouilhou, entitled "Generation and Duration of Pregnancy in the Human Race." The object of this work is to determine with almost mathematical precision, "when fecundation is possible in woman, and to assign a limit of time in the menstrual cycle to the generative faculty."

The determination of this law forms the subject of the first part of the pamphlet before us; in a second part the author treats of pregnancy, and inquires into the possibility of recognizing its commencement, of determining its duration, and of assigning to its termination a physiological period.

The theory of M. Avrard, concerning the moment when fecundation takes place, is no other than that of M. Pouchet, *verified*, *completed*, and *determined* in its modes and phases. "Fecundation," says M. Pouchet, "presents a constant relation with menstruation; also, with the human race, it is easy to determine exactly the intermenstrual period when fecundation is physically impossible, and that when it can offer some probability." By observation he endeavors to gain a confirmation of this assertion; to establish upon a solid and scrupulously exact basis the duration of the intermenstrual period, during which fecundation can alone take place; and to fix, as well as possible, the limits of this period.

M. Avrard, after having learnedly related and discussed the facts which seem to him calculated to throw light on the question, arrived at the following conclusions:

1. The cycle of generative functions lasts twenty-eight days. It is divided into three periods of unequal length, which the author calls *menorrhagic*, *generative*, and *hypnotic*.

2. Menstruation returns normally every twenty-eight days, starting from the accession of the courses. Its duration is indefinite.

3. A certain time elapses, most frequently, and perhaps always, between the end of the courses and the beginning of the generative period; this time the author calls the *interperiodic phase*.

4. The generative period ends always the fourteenth day after the beginning of the courses.

5. It has been shown, by an observation of fifteen years, and resting to-day upon thousands of facts, with proof and counter-proof, that woman is physiologically barren during fourteen days in twenty-eight, that is to say, after the fourteenth day, commencing with the appearance of the courses, till the end of the following period.

M. Avrard does not admit, as does the Professor of Obstetrical Clinic, at Paris, the possibility of impregnation during the period of the courses.

In the second portion of his work the author maintains, contrary to the opinion of M. Mattéi, that parturition, at natural term, coincides neither with the ninth or tenth catamenial period; but is effected always two hundred and seventy days after impregnation, whatever be the moment (often difficult to determine) of the generative period when the woman was impregnated. This normal limit can be exceeded, which is rare, or not be attained, which is common enough.

We regret our inability to analyse more at length this very attractive work of a distinguished observer, where are treated with so much taste and talent questions of the highest interest as regards midwifery, legal medicine, and hygiene, and also in a still more important respect. In short, far from considering the popularization of the physiological fact of which he treats as necessarily involving immoral results, a very learned theologian, to whom the author had submitted the question of temporary infecundity, has thought, on the contrary, that, man being free to use marriage, if not *as* he pleases, at least *when* he pleases, many men being prevented on prudential grounds from cohabitation, through fear of a too numerous progeny, will hereafter be able, thanks to the doctrine of temporary infecundity, to allow themselves, in all security, complete *normal*, and consequently *lawful* intercourse; without which, in the opinion of the moralists, economists, and physicians, domestic happiness can not exist.—*Jour. de Med. et de Chir.*, and *New Orleans Med. and Surg. Journal.*

A New Remedial Agent in the Treatment of Insanity and other Diseases.

The following is an account of a remedy which after several experiments Dr. S. Newington asserts he has found most useful in the treatment of insanity. It is a remedy which appears to him to afford a powerful and valuable means of withdrawing the blood from any diseased organ to which there is an abnormal determination; and, at any rate, it is often most efficient in subduing the excitement of mania and in inducing sleep.

"It is not known," he says, "that during sleep the quantity of blood in the brain is less than during wakefulness, and that the active circulation of much blood through the brain is incompatible with healthy sleep. When the cerebral functions are disordered from excess of activity, mental anxiety, or other cause, there is a determination of blood to the brain, sleeplessness ensues, and the effect in its turn becomes the cause of further mischief. Maniacal patients have been frequently brought to me who have been for six or seven days without sleep, and when repeated doses of morphia and antimony have proved worse than useless. Indeed, the frequent disappointments from the administration of narcotic drugs during an experience of twenty-two years in the treatment of insanity, have led me to try various experiments for the purpose of obtaining some simpler and more certain method of calming excitement and producing sleep.

"While staying at Matlock Bath, I was induced to try the effects of being wrapped up in cloths steeped in mustard and water, and applied to the whole legs and to the lower part of the abdomen. After the removal of a wet towel which had been applied round the head and was very uncomfortable, I began to experience the most soothing effects, and gradually passed into a dreamy semiconscious state, which lasted during the half hour I was under treatment. On getting up, I felt very lively and joyous, the liveliness lasting the whole day; and for nearly twenty-four hours there remained a pleasant tingling sensation in the legs, which were affected in no other way than by redness. It occurred to me at once that this kind of application might be very serviceable in certain cases of insanity, and immediately on my return home I

set about making experiments for the purpose of testing its value. The first experiment was upon myself.

"On retiring to rest I ordered a large basin of linseed meal and mustard (ten parts of the former to one of the latter) to be made into a paste, and spread upon a sheet of brown paper sufficiently large to cover the whole abdomen, a piece of muslin being interposed to keep the skin clean. In a short time I fell asleep, and was conscious of nothing till eight in the morning, when I was partially roused by persons about me; but I was unable to speak or move. One of my medical assistants was thereupon sent for, and he pronounced me in a state of stupor from some narcotic. Though I was unable to speak, I heard the whole of the conversation, and was in a dreamy semi-conscious state. On the administration of some stimulant I presently recovered.

"Another form in which I use the mustard is this: two handsful of crude mustard are tied in a cloth and placed in hot water, then squeezed in the hand until the strength of the mustard has been extracted. A thick towel, long enough to reach round the loins, is then wrung out of this infusion, wrapped round the body, and covered with a large piece of macintosh. In one case a patient suffering from acute mania, who was restless, sleepless, and refused food, was thus treated with the greatest benefit. Before the application the pulse was one hundred and eight, but after two hours of this treatment it had fallen to sixty in the minute, and the patient was in a quiet, semi-conscious state. Afterward he took his food regularly, and in a short time left, perfectly recovered.

"A third form in which this derivative treatment may be applied is as a mustard bath; in other words, an ordinary warm bath, into which have been thrown five or six handfuls of crude mustard. In some cases the deep hip bath only may be used; but in severe cases of mania the whole body of the patient, with the exception of the head, should be placed in the bath. A lady so treated, who had during the last year four attacks of violent mania, each lasting for five or six weeks, has now for twenty-two weeks had no further attack, although the symptoms usually forerunning the seizure have on several occasions occurred; the mustard bath appears to have warded off the recurrence of the excitement. In this case the bath was used once every twelve hours, for half an hour at a time, during a period of ten weeks; so that

the skin was kept in a constant state of redness. It may be hoped that the habit of diseased action has now been broken, and that this patient, after due probation, may be discharged as recovered.

"Mr. W— was brought to me in a strait-waistcoat, and as many as six people had been, it was said, necessary to control him before his arrival at Ticehurst. Notwithstanding repeated doses of opium, he had not slept for six days and nights; and through the night after his admission he was excited, restless, and talkative. On the following night he was placed in a mustard bath for half an hour, so that he was perfectly red on being taken out. During the next eight days he had six of these baths, and at the end of a fortnight after admission, he returned home on trial.

"A lady who, notwithstanding repeated doses of morphia, had not slept for seven days and nights, was admitted in a state of mania, extremely incoherent and excited. After being in the mustard bath for half an hour, she became calm and comparatively rational, and expressed herself as feeling much more comfortable. She was then wrapped up in a blanket and put to bed, where she soon fell into a sleep that lasted for seven hours; and in the morning she awoke free from excitement. The treatment was continued for six nights, and no further excitement occurred, although, as she had been insane for two years, her mind remained unsound.

"These instances, with others that I might quote, suffice to prove that in the proper use of these derivative measures, we have a valuable remedial agency in the treatment of insanity. As nature, aiming to restore the nervous element of the brain wasted by the day's labor, diminishes the activity of the circulation through it, and allows the process of repair to go quietly on, so we, imitating nature, strive in this treatment of insanity to withdraw the excess of blood from the disordered brain, and thus to favor the restoration of the natural equilibrium and the return of healthy function. And as when a morbid action continues for some time, a *habit* of it is apt to be formed, and the habit to become a 'second nature,' so, on the other hand, whenever the morbid activity is interrupted, the tendency to revert to its sound type, which exists in all organic elements, fails not to assert itself, and, if sufficient time be allowed, to restore the normal function. We perceive

then, how exceedingly important it is to produce natural sleep in the early stages of insanity.

"In using the mustard bath, it is necessary to protect the privates with a folded dry towel; and it is, of course, desirable to have the bath placed near the bed, so that the patient may pass directly from it into his bed. If a little constraint is required on the first occasion of its use, it will rarely be found necessary on any subsequent occasion."—*Half-Yearly Abst.*, vol. xlii., from *Lancet*, June 10, 1865.

Amputation at the Knee.

Professor Syme bears strong testimony (*Edinburgh Med. Jour.*, April, 1866) in favor of the advantages of Mr. Carden's method of performing amputation at the knee, which the Professor regards as one of the greatest improvements in modern surgical practice.

"When I began," says Professor S., "to amputate at the ankle, and found the great advantage of dividing the bone through its cancellated texture, it naturally occurred that the same consideration was applicable to the knee, and that, when circumstances permitted, amputation should be performed here rather than through the thigh, with its dense shaft and medullary texture. But, unfortunately, not being then aware of Mr. Carden's plan, I formed a covering for the bone by cutting it from the calf of the leg, which proved very inconvenient, and so counterbalanced the benefit anticipated, that this operation soon fell into disuse. Mr. Carden, pursuing quite an opposite course, made a semi-lunar incision in front, from side to side, with its convexity nearly over the tuberosity of the tibia, and reflected the flap of skin thus formed, so as to expose the muscles above the patella, where what remained of the limb was divided transversely. The popliteal artery, and any of the small branches that required ligature having been tied, the ample covering of integument was brought down to its place, where, being secured by sutures, it lay without any tendency to retraction, or requiring the restraint of bandages, while the dependent opening afforded a free vent for the discharge of matter. No trouble was experienced in the after-treatment, and the stump proved entirely serviceable, since

the skin over the bone, instead of becoming thinner, acquired additional thickness, so that the patients could rest upon it just as they do after amputation at the ankle.

"But the advantages of this operation are not limited to its facility and satisfactory results in the event of recovery, since its great claim to respect and confidence is the safety that attends its performance."

On the 19th of September last Professor S. saw, with Mr. Annandale, a patient in the hospital "who had been admitted with both of his legs completely shattered by a large mass of iron falling upon them. It was obvious that he must die if the limbs were retained, and no less so that amputation of both thighs would in all probability prove fatal. I therefore suggested that Mr. Carden's operation might be performed, which was accordingly done by Mr. Annandale with the most satisfactory result."

Soon after this (October 23) Professor S. saw, with Dr. Mackensie, of Kelso, "a young farmer whose life was in great danger. It appeared that while on horseback, during the race week, he had been struck by the shaft of a cart in the crowded street, with such violence as to cause a fracture of his leg. There was no wound, but the limb suddenly swelled and became cold, with dark discoloration. Inflammatory symptoms succeeded, with corresponding constitutional disturbance, and on the fourth day it was generally supposed that the case must prove fatal from spreading gangrene. But Dr. Mackenzie thought that amputation might still afford a chance of escape; and although the prostration was extreme, with a pulse hardly to be felt, so that cutting through the thigh must have been almost fatal, I proposed to operate at the knee, and did so without delay, when it appeared that the posterior tibial artery had been ruptured at the seat of injury. The patient was no sooner relieved from the mortified limb than he began to improve, and, through careful nursing, made a good recovery with an excellent stump.

"On the 4th of November, Dr. Hislop, of North Berwick, requested me to see a clergyman who had been confined to bed for more than twelve months, by disease of the knee-joint, with no prospect of improvement, and constantly increasing weakness. It seemed that skin and bone naturally predominated in the constitution of his frame, and that from long-continued exhaustion little else of it remained. I should, therefore, have regarded am-

putation of the thigh as a most unpromising procedure, but with my recently acquired faith in the knee operation, felt no hesitation in performing it. Everything went on favorably afterward, and the reverend gentleman speedily regained his health, with a comfortable stump."

"On the 1st of January, W. M., aged thirty-two, was admitted into the hospital on account of a compound fracture which his leg had sustained on the railway. An attempt was made to save the limb, apparently for a time with some prospect of success; but on the 9th, from the amount of discharge and the extent of shattering which was revealed by the ulceration and sloughing that had taken place, it became obvious that amputation afforded the only chance of escape. I therefore operated at the knee; and although the circumstances were most unfavorable for recovery, I had the pleasure of seeing the patient gradually improve in health, with the prospect of a good stump.

"A boy, aged six, was admitted into hospital on the 20th of January, with mortification of the foot, from a railway injury, and threatening of gangrene extending up the leg. I amputated at the ankle, in the hope of arresting the mischief in progress, but with only partial success, since inflammation affected the periosteum, so as to cause necrosis of the whole tibia, and establish profusely discharging sinuses above as well as below the knee. The patient then became so extremely weak that his case appeared to be hopeless, and would, I believe, have proved to be so, had we not possessed a milder alternative than amputation of the thigh. I removed the limb at the knee on the 14th of this month, and the operation was followed, instead of sinking, by such an improvement of condition as encourages us to look for the most satisfactory result.

"Soon after his double amputation at the knee, Mr. Annandale had a patient, in private, suffering from disease of the knee-joint, who was so exhausted by hectic, bed sores, and profuse discharge, that amputation of the thigh seemed to afford no prospect of recovery. He, therefore, amputated at the knee on the 25th of October, with the almost unlooked for result of complete recovery.

"Dr. Joseph Bell, who takes charge of the surgical clinical wards in my absence, admitted a patient on the 26th of January, who had suffered a compound fracture of both legs on the railway then in progress of construction at Queensferry, whence he had been brought all the

ten miles in a cart. One limb was shattered beyond the possibility of recovery, the other being less seriously injured. The former was amputated at the knee, and the latter so successfully treated that the man is now able to walk on it with the assistance of crutches.

"From what has been said, I trust it will appear—

"1st. That Mr. Carden's operation is less dangerous to life than amputation of the thigh.

"2d. That the execution, ligature of vessels, and after-treatment, are simple and easy.

"3d. That the resulting stump is comfortable and serviceable.

"These considerations will, I trust, meet with due attention, and tend to promote the adoption of a procedure destined, I feel assured, to supercede amputation of the thigh, which, notwithstanding all the attempts to prove it, has so long remained an opprobrium of surgery."

On the Trichina and Trichinosis. By M. DELPECH. (*Annalles d'Hygiene Publique*, Julliet, 1866.)

In an elaborate report on various papers on trichinosis, communicated to the Academy of Medicine, Paris, and from a review of the whole subject, M. Delpech arrives at the following conclusions:

"Although the symptoms and gravity of trichinosis had been fully known only since the year 1860, still the disease was by no means a recent one, and its existence in Germany at a remote period, in an epidemic form, could be readily demonstrated.

"It was then confounded with various other affections, and was more especially looked upon as a peculiar and exceptional variety of typhoid.

"The disease has since given rise to much arduous research, and can scarcely in future escape detection, when it has been attentively watched in every stage of its development.

"Disturbance of the digestive organs followed by œdema of the face, and subsequently by severe muscular pain, and by a degree of dyspnœa which may even end in asphyxia on account of the impossibility of the movements of respiration, is an aggregate of symptoms not to be met with in any other affection. These morbid manifestations correspond with the successive birth in the

digestive tube, and of the passage into the muscular structures of trichinæ in numbers sometimes enormous, but in general proportionate to the quantity of parasites which have been swallowed. Their presence can be demonstrated during life by the microscopic inspection of a minute particle of muscle removed from the patient's person with peculiar instruments, and by an innocuous and almost painless operation. In doubtful cases, the diagnosis can, therefore, at a certain stage of the disease, be confirmed by direct inspection.

"In general, one tainted animal will infect many persons. Hence more or less widely-spread and severe epidemics, according to the condition of the animals, the variable quantity of the flesh consumed, and the mode of cooking adopted.

"Certain animals are, as well as man, liable to trichinosis. In carnivora and omnivora the complaint occurs spontaneously, and herbivora may also artificially become affected, but only by the intervention of the human subject.

"In man the disease arises from the consumption of raw or insufficiently cooked pork flesh, tainted by the presence of trichinæ.

"In pigs the propagation of the parasites is referable to several causes. They eat trichinized animals, especially rats, dead or alive, or abandoned on dunghills or in fields. They feed on human excrement, or on the dejecta of pigs which have recently consumed trichinized flesh, and which excrete, with the contents of their intestines, fecundated female trichinæ. Moles, earth-worms, the larvæ of flesh-flies, the beetroot worm, have nothing to do with the transmission of trichinæ.

"When the disease occurs spontaneously in pigs, it seldom gives rise to characteristic symptoms, and microscopic inspection alone leads to the knowledge of the parasites. In the human subject, the cyst, when encrusted with calcareous salts, can easily be discerned with the naked eye, in the shape of white patches, and the microscope affords further conclusive evidence. In the countries where trichinosis prevails, this mode of examination has become a general precaution, whether carried out by individuals or by order of the Government.

"Merely optional microscopic examination, although doubtless useful, can give no absolute security, on account of the necessary absence of regularity and supervision.

Compulsory examination alone can yield any seriously beneficial results. Two objections are urged against it, viz.: the difficulty of carrying it out, and the uncertainty of the information supplied in cases in which the animals are but slightly affected. These are, it is true, serious considerations, but nevertheless the advantages derivable from compulsory microscopic inspection are such that the measure should unhesitatingly be adopted in all countries contaminated by trichinosis.

"France appears hitherto to have escaped the contagion, and no cases have yet been adduced of acute or encysted trichinosis, nor have any records been brought forward of former epidemics, as in Germany. The rats of the slaughter-houses do not seem to have been infected; at least, not habitually. The immunity is to be traced to the different customs of both countries, and to the more complete boiling to which the meat is submitted in France, which checks the development and propagation of the parasites.

"A temperature of 75° Cent. (167° Fahr.) alone can secure the destruction of the trichinæ. The same result may be attained by thorough and protracted salting, or by a hot fumigation of twenty-four hours' duration. Cold smoking does not destroy the worms."

On the Practical Value of Accurate Daily Observations of the Temperature of the Body in Acute Diseases. By Dr. THOMAS ARMETIRDING COMPTON.

The general conclusions which Dr. Compton has come to have been arrived at after a careful study of some one hundred and twenty-five cases taken by himself during the last two years, at St. Bartholomew's Hospital, and also of some seventy-five other cases taken in the same hospital, during the same period, by Dr. Warter.

The total number of cases in which the temperature and general symptoms have been watched and recorded daily throughout their course, amounts to two hundred, of which sixty are typhus, thirty typhoid, twenty pneumonia, fifteen scarlet fever, and the remaining seventy-five comprise cases of febricula, acute rheumatism, erysipelas, cholera, acute tuberculosis, etc. The total number of observations in these cases, and in others in which only

one temperature has been recorded by Dr. Warter or Dr. Compton, probably exceeds five thousand. Dr. Compton states what he considers to be approximately the average normal temperature of an axilla in a healthy adult. A temperature of 98°·4 Fah. is the point generally settled upon by the majority of authorities on the subject; but this Dr. Compton believes to be too high, as although he has not at present taken a sufficiently large number to decide the question to his own satisfaction, yet he can state that he has very rarely found such a temperature present in a healthy adult under normal conditions. "I have," he says, "every reason to think such a temperature to be nearly up to the maximum, consistent with health, and to be only met with occasionally, just as one comes across, now and then, a healthy adult with a temperature below 96° Fah. I consider the healthy range to be somewhere between 95°·5 and 98°·5 Fah., the most common temperature met with, being probably 96°·4 Fah., *i. e.*, one degree less than the temperature hitherto most generally received as the normal one."

Dr. Compton seeks to establish the following propositions from his observations:

1st. That a continued daily temperature of 99° Fah., and upward, indicates an unhealthy condition, and occurs in every case of acute disease.

2d. That any one observation of a very high temperature (such as 105° Fah.), in any case in which the general symptoms do not appear of any particular severity, should lead to a very attentive reëxamination, and suggest a very careful watching, especially if occurring in a non-diagnosed case; such a temperature being present only in severe forms of any disease.

3d. That the thermometer is of great use, as a means of diagnosis in those cases which frequently present themselves, of general *malaisc*, often accompanied by a history of rigors, loss of sleep, etc.; such symptoms being due either to the commencement of one of the specific fevers, or merely to some gastric or uterine disturbance of a temporary character.

4th. That the temperature in every disease has a tendency to run a peculiar course, and has a certain range of altitude, a knowledge of which course and range is of great value as an assistance to us in diagnosis and prognosis.

5th. From the last proposition it follows, that the same

altitude of the thermometer attained at one period of any disease is not of the same importance as the same height reached at another time in the same disease.

Thus, in typhoid fever, a temperature which has been rising for two or three days, reaches perhaps 104° Fah. between the seventh and fourteenth days, without causing any anxiety; whereas, should the same phenomenon occur about the twenty-eighth day, a fatal termination may probably be expected.

And again, the actual altitude attained on a certain day in one disease is not of the same importance to our prognosis as the same height reached on the same day in another disease. Thus, a temperature of 104° Fah. in erysipelas is very common during the first week, and need not give rise to any alarm; but should such occur at the same date in acute rheumatism, Dr. Compton would consider it of much more importance.

6th. That although, in all diseases, a high range of temperature generally indicates a severe case, with a slow convalescence, and a low range usually occurs in a mild case, and is followed by a rapid convalescence; yet there is no actual temperature in any disease which necessarily foretells a fatal termination.

7th. That in the majority of cases a rise of temperature is contemporary with a rise of pulse, although such is often not a proportional one, and may not take place at all unless the alteration in temperature by as much as $1\frac{1}{2}°$ or 2° Fah.

8th. That where the temperature and pulse together do not coincide with the general symptoms, the two former may be generally relied on as to the actual state.

9th. That where the temperature and general symptoms agree together, but do not coincide with the state of the pulse, the two former may generally be relied on as to the actual state.

10th. That in those cases in which the pulse and general symptoms remain the same, a moderate fall of temperature on one occasion is not to be relied on; but should such a fall continue in a moderate and gradual manner, for some days, and at such a period when a fall was to have been expected, the temperature may then be depended upon. Severe cases of typhus, toward their close, often give examples of this sort.

11th. That in those cases in which the pulse and general symptoms continue the same, being the one frequent

and the other severe, a continuous rise of temperature for some days, occurring at a period of disease at which some improvement might generally be expected, is usually the precursor of a fatal termination.

12th. That although it is possible that the state of the temperature alone in acute disease may, perhaps, hereafter prove to be the one safest symptom to rely upon if taken by itself (and I believe it is at present, at least, equal to the state of the pulse, and of greater value than this certainly, if only its frequency be taken into account), yet the temperature must be considered merely as an aid, and all other symptoms must be carefully examined into, as it is on comparison with these that its greatest value is always to be found.—*Dublin Quarterly Journal of Medicine, August*, 1866.—*Ranking's Abst.*

On the Treatment of Scabies by Oil of Petroleum. By Dr. DECAISNE.

From a report published in the *Archives Médicales Belges*, we learn that Dr. Decaisne has used the oil of petroleum successfully in upwards of six hundred cases of scabies. In the great majority of the subjects the disease was completely cured after a single friction, in several after two, and in a very few instances were three or four inunctions required. The method failed in two or three cases only, and sulphuret of lime was necessary to effect a cure.

It has been objected that oil of petroleum is an irritant and produces rashes, but M. Decaisne remarks that the remedy applied with proper precautions seldom causes this unpleasant result.

"At first the frictions were performed with rough towels and brushes, and probably, in order to lacerate the sulci, the oil was rubbed violently into every part of the skin more particularly affected. The inevitable result was the exposure of the dermis, and rashes consequent on the mechanical irritation. Military surgeons have, however, found from experience that this is unnecessary, and now the inunctions are more gently performed. But even this plan was open to improvement. It may be a matter of indifference when the skin is healthy to use a brush, a rough sponge, or a hard towel, but in the case of scabies the vesicles are often broken, and the cuticle destroyed,

and the softest aquarelle brushes should be used to spread the oil on the integument.

"Since brushes of this description have been used in barracks, the secondary eruptions have all but ceased, and when any have appeared they were the result of an error of diagnosis which can not always be easily avoided in case of some standing. Prurigo, eczema, impetigo, are often mistaken for scabies, and in these affections the evil effects of repeated and inopportune frictions are readily accounted for."

M. Decaisne also adverts in his report to the disinfection of the clothing. Experiments instituted in the military hospital and garrison at Antwerp have shown the utter inutility of the measures in habitual use. Since they have been discontinued, relapses have become less frequent, and the inutility of disinfection is, therefore, now fully demonstrated, and this expensive procedure, founded on routine and not on scientific experience, should henceforth be abandoned. If it be even conceded for the sake of argument that the acarus can continue to live elsewhere than in its natural *habitat*, the operation would still be unnecessary, because in resuming his wearing apparel the patient exposes to the action of the petroleum with which his person is saturated, the few sarcoptes which may remain in his clothes.

The treatment with petroleum oil thus combines with its great efficacy the additional advantage of economy, because the process of disinfection is dispensed with, and the entire cost of the medication does not exceed for each case three or four centimes.—*Jour. of Practical Medicine and Surgery, Jan.*, 1866.—*Ibid.*

On Morbid Conditions and Injuries of the Spleen in the Pregnant and Parturient States. By Sir JAMES SIMPSON, Bart.

In a paper read before the Obstetrical Society of Edinburgh, Sir J. Y. Simpson referred to three cases of fatal rupture of the spleen, which had occurred respectively in the pregnant, parturient, and puerperal states. He pointed out the circumstance that, during pregnancy, there is often, if not generally, an increase of the white particles of the blood, or, in other words, a kind of normal or

physiological leucocythemia. As in states of morbid leucocythemia, the spleen was often enlarged; so was it also occasionally in pregnancy. Perhaps it would be found in practice much more common than the silence of authors on the subject might lead medical men to suppose. It sometimes recurred in successive pregnancies. In one patient of his, the spleen became enlarged to a very marked degree in a series of successive pregnancies, and this splenic enlargement disappeared always after delivery. Her youngest child is now about ten years old, and during that time there has been no recurrence of the splenic hypertrophy in the mother. A certain amount of softening very frequently accompanies the hypertrophy of the spleen, and predisposes to the laceration of the organ under strong exertion and muscular effort, blows, etc. The first case of rupture of the spleen in a child-bearing mother whieh he saw was a patient of Dr. Husban's. She began to show symptoms of fatal sinking shortly after premature labor set in, about the sixth or seventh month. On opening the body after death, the enlarged spleen was found lacerated, with effusion of blood into the peritoneal cavity. Shortly afterward a patient of Dr. Wilson's who had been delivered a week or two before, after making some unusual muscular exertion, complained of abdominal pain and sinking, and died. Rupture of the spleen and effusion of blood were found on dissection. The late Dr. Cunningham, of Currie, delivered a patient in Edinburgh, using the forceps. He left very shortly afterward to catch the railway train. The patient sank and died within an hour or two. An inspection of the body was ordered by the law authorities, when rupture of the spleen, and consequent effusion of blood, were found to be the immediate cause of death.—*Edinburgh Medical Journal, Sept.*, 1866.—*Ibid.*

On the Therapeutic Uses of Oxygen. By M. DEMARQUAY.

M. Demarquay, who has devoted much attention to the use of oxygen inhalation in medicine, says, in speaking of its therapeutic indications, that, in the early stage of phthisis, when there is no fever, and no fear of exciting local action, when the patient is becoming emaciated, and the emaciation is increased by persistent dyspepsia, oxygen may have a salutary influence in modifying the state

of the constitution and sustaining the organism. Asthenia is the disease in which oxygen has been given by preference; of twenty-two patients treated by Beddoes, ten were cured, and nine relieved. But the employment of oxygen in asthenia meets with numerous contra-indications. Oxygen renders incontestable service in essential anæmia. It is specially indicated in that form of chlorosis of young girls which is characterized by obstinate anorexia; in the anæmia of convalescents, and in the anæmia, often severe, of newly delivered females. The inhalation of oxygen is also successful in anæmia arising from hæmorrhage or from fatigue, and is also a very energetic remedy in the debility produced by prolonged suppuration; it stimulates the appetite, sustains the powers of the patient, and enables him to attain to recovery. In diabetes, under the influence of oxygen inhalation, the quantity of sugar contained in the urine is remarkably diminished. In surgery, oxygen stimulates weak and ill-conditioned ulcers, and accelerates the production of granulations in cicatrizing wounds. In senile gangrene, as long as the circulation continues in the artery of the foot, oxygen is, according to the observations of MM. Laugier, Demarquay, and Maurice Raynaud, the only remedy which in advanced cases affords a chance of recovery.—*Gazette Médicale de Paris*, 13 *Avril*, 1866.—*Ibid.*

On Peritoneal Friction-Sounds. By Dr. SEIDEL.

Peritoneal friction-sounds, Dr. Seidel states as the result of his observations, have been noted on a level with nearly all the abdominal organs. Their signification is very variable. They indicate the existence either of a chronic or an acute malady, but more rarely the latter. It is not necessary for the production of a friction-sound that the peritoneum should be supported, as it were, by a solid part. In the majority of the cases the friction-sound was somewhat rhythmical, under the influence of respiratory movements, which were perceptible even in the hypogastrium. The perihepatic friction-sound, particularly when occurring over the convex surface of the organ, might easily be confounded with a pleuritic friction-sound. To distinguish the one from the other, let the patient make a forced inspiratory movement, the glottis being closed, a

movement similar to those which accompany vomiting. In this movement the inferior border of the lung is not sensibly displaced whilst the liver is notably elevated. If the friction-sound remains under these circumstances, it is almost certain that it is of peritoneal, not pleural origin. In no case has a non-rhythmical sound, arising from the peristaltic movement of the intestines, been noted. Peritoneal friction-sounds are observed of every grade, from an extremely slight rustling to a veritable rasp.—*Schmidt's Jahrbücher*, 1866, *No.* 4; *Archives Générales de Médecine, Juin*, 1866.—*Ibid.*

EDITORIAL AND MISCELLANEOUS.

INFANTILE FEVERS.

It has long been a rule with me, and I have endeavored to impress the precept upon my friends and patrons, never to allow a child to have a second paroxysm of fever, if it be possible to prevent it. Children in this country are subject to the same class of fevers as we find affecting adults. That is to say, they very often have intermittent and remittent fevers, which can be arrested after the first paroxysm by the use of sulphate of quinine, and which, if not thus timely treated, may prove fatal, by the supervention of convulsions, coma, or other unmanageable complications. If a child or an adult have a paroxysmal fever, he will most probably have a repetition of it a little earlier on the following day, and sometimes one day later; and although the first paroxysm may be comparatively light, the next may be very serious. A sufficient quantity of quinine administered some hours before the expected return of fever, will make the child safe. It is true that children not unfrequently have a paroxysm of ephemeral

fever which would have no sequence even if left to itself. But there is no way in which we can distinguish these fevers from those that will recur. It is therefore always better to use the quinine, which may save the child's life if the attack be of a malignant character, and which can do no harm whatever if it be ephemeral. One grain of the sulphate of quinine for each year of the child's age will be found usually quite enough to prevent the return of fever, and it may be given in divided doses or all at once, care being taken to have the system under its influence at the hour of the apprehended attack. Many persons in as well as out of the profession give quinine in much larger quantities; but I feel satisfied that while the proportion above recommended is enough to obtain the desired effect, larger quantities are very trying to children. They certainly do not tolerate this remedy as well as adults do. It affects their head unpleasantly and makes them very nervous and fretful. It may not be amiss to state that many children will reject quinine as often as it may be given. In such cases it should be administered *per rectum;* the same quantity being used and given, all at once, in a tea-spoonful or two of thin starch or mucilage.

L. A. D.

A Manual of Medical Jurisprudence. By ALFRED SWAINE TAYLOR, M.D., F.R.S., Professor of Medical Jurisprudence and Chemistry in Guy's Hospital, etc.; with notes and references to American Decisions, by Clement B. Penrose, of the Philadelphia Bar.

This is the eighth English and sixth American edition, and a glance at the table of contents shows that the perfection of the work is only limited by the imperfections of the science. The arrangement of subjects in the present volume is a decided improvement upon former

editions for, to make it a "convenient guide to medico-legal practice" by the unskilled, it is eminently proper to devote the opening chapters to instructions as to their duties and responsibilities, and the nature of medical evidence. Besides this change new subjects have been introduced, with amplifying notes by the American editor, thus making it one of the most valuable text-books of the science known to the profession. Of these, the most important are trichiniasis and life-insurance: the former is a new and fatal malady connected most prominently with the ingestion of poisonous animal food, and of such peculiar interest to the profession at present, that we will presume to offer the following extract touching its history and medico-legal relations:

"From these researches," says the author, "it is now clearly established that the trichina is a viviparous parasite, which passes the greater part of its existence in the chrysalis state in the muscular system, until, by the consumption of this muscle as a food, it finds in the stomach and intestines of another warm-blooded animal a favorable medium for its full development into an intestinal worm. According to Virchow and Henker, the trichina not only frequently presents itself in the human organism, but this organism is most favorable to its development. The period of incubation of the chrysalis in the stomach and bowels of man or of warm-blooded animals, is from six to eight days; and during this time it there thrives and propagates to an almost incredible extent. Dr. Keller states that in three or four days the females produce one hundred or more young ones, which begin on the sixth day to leave the parent animal; and he estimates that in a few days after the ingestion of half a pound of meat, the stomach and intestinal canal of a person may contain thirty millions of these minute worms. M. Herbst found the muscles of two dogs which had been fed upon parts of a badger containing worms, to be loaded with these parasites. When once introduced into the stomach and intestines, the worms leave their capsules, become free, and produce young, which migrate through the walls of the intestines into the muscles; there they become encysted, and are ultimately found appropriating and destroying the muscular substance to a greater or less extent. The sudden liberation of a large number of these worms causes irritation and inflammation in the bowels, attended by peculiar symptoms, resembling in some respects those of poisoning.

It is worthy of note that trichina are more frequently found in pork and articles of food derived from it, than in any other kind of meat, measly pork appears to be something of a trichinous character. Further, the vitality of the parasites is not destroyed unless the meat or other substances in which they are located, has been subjected to a temperature equal to that of boiling water for a sufficient time to insure that every particle has been exposed to this degree of heat. Salting and smoking, or partial cooking, is not sufficient to destroy the worms in all parts of the food, and they have even been found living in putrefied meat. This may serve to account in some cases for the serious symptoms which have followed the use of pork as food, also of bacon, sausages, and German sausages, which are generally made of raw ham.

The symptoms produced by the use of such food are, in the first stage, those of intestinal irritation, loss of appetite, sickness, pain, general weakness of the limbs, with diarrhœa, swelling of the eyelids and of the joints, profuse clammy perspiration, and a wasting fever, sometimes of a typhoid character. Death is either the result of paralysis (from destruction of the muscular fibres) or of peritonitis and irritative fever. During the perforation of the coats of the intestines by these worms, the mucous membrane becomes irritated and inflamed; pus is formed on its surface, and bloody evacuations are sometimes passed. No case is known in which trichiniasis, after having once declared itself, was arrested by medical treatment."

In the medico-legal bearings of the subject, the author continues:

It is probable that some unexplained cases of death from irritation of the stomach and bowels, simulating chronic irritant poisoning, may have been the result of eating food containing trichina spiralis. Medical men have been unable to group the symptoms under any known form of disease, while the marks of irritation and inflammation in the mucous membrane of the bowels have given strength to the supposition that poison must have been taken by the deceased, although chemical analysis had failed to show the presence of any ordinary poison in the fluids and solids of the body. In the course of many years' practice, I have met with several cases of this description, and there has been sometimes manifested a disposition to doubt the accuracy of chemical analysis. Dr. Lücke has related a series of fatal cases which occurred in 1845, attributed at the time to poison, which, as he suggests, were most probably caused by the use of trichinous food. (Casper's Viertiljahrschrift, January, 1854, p. 102.)

As means of distinction from irritant poisoning may be pointed out the long time which commonly elapses between the taking of the food

and the commencement of the symptoms. The pain, vomiting, and purging are comparatively slight; the pain is in the bowels rather than in the stomach, and peritonitis, pneumonia, and fever are not commonly the results of the action of irritant poisons, while they appear to be constant symptoms in trichinosis. The absence of ordinary poison in the food, in the urine, and the evacuations, at any stage, may also be taken as conclusive evidence against irritant poisoning in its usual form.

In suspected cases, a new method of research must be added to those already in use. If any of the food can be obtained, this must be examined for the parasite by the aid of the microscope. If the case prove fatal, the voluntary muscles of the deceased must undergo a similar examination.

The American editor appends at this point the following note, which will serve to awaken a lively personal interest with our readers. It is evident that our only safeguard against its epidemic prevalence in this country is, as has been suggested, in the system of thorough cooking to which our food is subjected:

A committee was appointed some time since by the Chicago Academy of Sciences to ascertain, first, whether trichina actually exist in the hogs of this country, and in those of the Northwest in particular; and, secondly, should they exist, to determine the extent of the danger thereby incurred, and to ascertain the best means of averting it. For the attainment of the first object, portions of muscles from one thousand three hundred and ninety-four hogs in the different packing houses and butcher-shops of Chicago have been examined, and the results presented in tables.

These tables show that the committee have found trichina in the muscles of twenty-eight hogs out of one thousand three hundred and ninety-four examined. We may, therefore, conclude, that in the hogs brought to Chicago, one in fifty is affected with trichinosis in a greater or less degree. We must confess our surprise at arriving at this result, which indicates, with little doubt, the startling fact that trichinosis in pork is even more common in this country than in Germany, where it caused so much suffering and death. For instance, in the city of Brunswick, where a most careful inspection of nineteen thousand seven hundred and forty-seven hogs was made in the years 1864–5, only two were found to contain trichina in their muscles, the proportion being one to ten thousand against one to fifty as before stated, in our country. The comparative immunity from disease which our own people have enjoyed, undoubtedly results from our habit of cooking

meat before eating it, while in Germany it is eaten raw by the poorer classes, on account of the high price of fuel. The committee have found the spinal muscles more liable to be infested with the trichina than other muscles. (p. 163.)

The closing chapter of the volume upon the subject of life-insurance is very instructive and interesting: we can not notice it at length, but simply direct attention to it, as a novel subject, of great importance to all classes of the community. W. H. D.

INFLUENCE OF MARRIAGE ON LONGEVITY.

The Boston *Medical and Surgical Journal* of March 7, 1867, contains an interesting article on "The Influence of Marriage on Longevity," by James Stark, M.D., of Edinburgh, of which the following is an epitome:

What is the effect of marriage on male and female life? Is its influence, in so far as the death-rate is concerned, favorable or not? Is its influence limited to the female, or has it, also, a marked influence on the duration of life in the male? These are important questions. Table II includes married and unmarried men of each quinquennial period of life in Scotland in 1863, deaths at the same ages, and the percentage of deaths to the living at each age, and shows results quite startling as to the immense difference between the mortality of the married and unmarried.

It appears that from every age, from twenty to eighty-five, the death-rate of married men is much smaller than that of the unmarried. Reading the tables without decimals, so as to make them more intelligible, of every hundred thousand bachelors between the ages of twenty and twenty-five years, one thousand one hundred and seventy-four died annually; but of the married men, only five hundred and ninety-seven, or just one half. As the age

increases, the death-rate decreases, but slowly and regularly. Thus, at the ages from twenty-five to thirty years, when the number of bachelors and married men in Scotland is pretty nearly equal, of every hundred thousand bachelors one thousand three hundred and sixty-nine died annually, but of the married only eight hundred and sixty-five. Without going in detail over every separate age, but to mention one more—even at the extreme ages of eighty and eighty-five years, while nineteen thousand six hundred and eighty-eight of the bachelors died, only seventeen thousand four hundred married men did so. These facts are rendered still more striking if we calculate the mean age at death of the married and the unmarried men. The result is, reckoning from the twenty-fifth year to the close of life, that of the married was 60 2-10 years, while that of the bachelors was only 47 7-10, giving twelve and a half years in favor of the married.

This is a remarkable fact, and apparently a special provision of nature to protect the father of a family, in order that he may provide for his offspring and superintend their rearing. It is quite true that this special protection from death is based on fixed laws of nature, by which we see that the generally quiet and regular life of the married man secures him from falling a victim to diseases, to which the more irregular, and often more dissipated life of the bachelor renders him prone. To Insurance Companies statistics like these are invaluable, because they point out to them an unsuspected source of danger, whose influence for evil is as great as vicious habits, or the existence of organic diseases, or descent from a scrofulous or consumptive family.

Similar tables, referring to women, are given, showing valuable information, embracing the two consecutive years of 1861 and 1862. When the mean annual percentage of deaths in the married and unmarried female at each quin-

quennial period of life is compared, it is noted that the married die in a higher ratio during the three periods of fifteen to twenty, twenty to twenty-five, and twenty-five to thirty years; but, that during the next two periods, viz.: thirty to thirty-five, and thirty-five to forty years, during which half the children are born, the married die at a lower rate than the unmarried. At the age when the usual "change of life" occurs, viz.: between forty and forty-five years of age, the mortality of the married slightly exceeds that of the unmarried woman—a result which might have been expected, seeing that the fatigues of child-bearing, and nursing, and the harder labor connected with the rearing of her family, somewhat weakens the system. From forty-five to seventy-five years of age, the married die in smaller proportion than the unmarried woman.

It will be seen that at every quinquennial period of life, the difference between the death-rates of the married and unmarried women is very much less than that between the married and unmarried men. It is thus demonstrated, for the first time, that marriage exerts a much more powerful influence on the male than the female; for, whereas, the influence of marriage on the female death-rate is comparatively trifling, it is the most marked and potent on that of the male. The common belief has always been the reverse of this—it being, that marriage, by adding to the female the dangers of child-bearing, would be found to increase her mortality; but it was never once suspected that it would make any difference in the mortality of the male. These facts, however, whose correctness there is no denying, disprove all this, and show that marriage exerts a much more powerful influence on the mortality of the male than all imagined sanitary improvements could ever hope to effect.

At the three quinquennial periods of fifteen to thirty years, married women died at a somewhat higher rate than the unmarried. From fifteen to twenty years, in every hundred thousand married women eight hundred and sixty died annually, whereas, of the unmarried, only six hundred and ninety-two; from twenty to twenty-five years, of the married nine hundred and eleven died, of the unmarried seven hundred and eighty-three; from twenty-five to thirty years, of the married nine hundred and forty died, and of the unmarried eight hundred and sixty-six. During the next two periods, however, married women died in a lower ratio than the unmarried. From thirty to thirty-five years, nine hundred and fifty-six married died, and nine hundred and ninety-five of the unmarried; and from thirty-five to forty years, one thousand one hundred and eighteen married died, and one thousand two hundred and six of the unmarried. It is an interesting inquiry, to ascertain why it is that the mortality of the married, under thirty years of age, is higher than that of the unmarried women. Every man knows that the risk to the mother is far greater at the birth of her first child than at any subsequent delivery; and it is extremely probable that the whole extra mortality of the married female under thirty years old, may be caused by the greater dangers which attend the birth of her first child.

Table V includes the number of mothers in Edinburgh and Glasgow in 1855; the number of these confined with their first child, and the proportion per cent. of mothers who bore their first child. The results are: between fifteen and twenty years of age, eighty-seven per cent. of mothers gave birth to their first child; from twenty to twenty-five years, fifty per cent.; from twenty-five to thirty years, twenty per cent. It was only, then, at the ages when a very large proportion of the married women were giving birth to their first child, that the death-rate

rose higher than that of the unmarried women; but the moment that age was attained, when the great majority of the women had got over the birth of their first child, viz., thirty years, the mortality fell even below that of the unmarried women. This seems clearly to prove that it is bearing the first child which causes the higher mortality of mothers between fifteen and thirty years of age.

Seeing these things are so, there is nothing to prevent the higher mortality of the women under thirty years of age being quite arrested. Medical men all know whence the dangers of the first birth arise. The causes are almost entirely removable: they are almost wholly due to our civilization and faulty habits, which produce an over-excitable, unduly-stimulated, yet worn-out frame, where health and vigor ought alone to exist. F.

☞ The Eighteenth Annual Meeting of the American Medical Association will be held in Cincinnati on Tuesday, May 7, 1867, at 11 o'clock, A. M.

Secretaries of all medical organizations are requested to forward lists of their Delegates as soon as elected, to the Permanent Secretary, Wm. B. Atkinson, M. D., 215 Spruce street, Philadelphia.

Watson Abridged: A synopsis of the Lectures on the Principles and Practice of Physic, delivered at Kings College, London, by THOMAS WATSON, M.D., Fellow of the Royal College of Physicians, etc. Abridged from the last London edition, etc., by J. J. Meylor, A.M., M.D. Philadelphia: Published by the Author, 1867.

The principles and practice of physic by the distinguished Sir Thomas Watson, have long been received favorably in America, and we feel assured that the abridgment by Dr. Meylor will be popular among students, as a valuable aid to them in their medical studies. We recommend it. F.

Injuries of the Spine; with an analysis of nearly four hundred cases. By JOHN ASHHURST, Jr., A.M., M.D., Fellow of the College of Physicians of Philadelphia; member of the Academy of Natural Sciences, etc. Philadelphia: J. B. Lippincott & Co. London: Trübner & Co., 1867.

We commend this small volume, as containing valuable and interesting matter. The author has labored with great zeal in making such a large collection of cases, and suggests rational plans of treatment which are worthy of note. F.

GEORGIA MEDICAL ASSOCIATION.

This Society met at Griffin, Ga., April 10th, at twelve o'clock, and was called to order by its Presiding Officer, Dr. A. Means.

Prayer, by the Rev. D. W. Gwin.

The hospitalities of the city were tendered to the Association in a neat and appropriate manner by Alderman Nunnally. After which, the press and the city authorities were invited to seats upon the floor during the session.

Next followed the recording of names and calling the roll, when it appeared that about forty members answered to their names.

The minutes of the last meeting were then read and confirmed, and the Society adjourned until 2½ o'clock, P. M.

AFTERNOON SESSION.

The first business was the election of officers for the ensuing year, which resulted as follows:

President—Dr. CHARTRES, of Savannah.
1st Vice President—Dr. T. S. POWELL, Atlanta.
2d Vice President—Dr. DES. FORD, Augusta.
Corresponding Secretary—Dr. MYERS, Savannah.
Recording Secretary—Dr. L. H. ORME, Atlanta.
Treasurer—Dr. J. D. FISH, Savannah.

The Valedictory of Dr. Means was then delivered in his usual peculiar and forcible style of eloquence.

Dr. Chartres, the President elect, on assuming the Chair, made a few brief but eminently practical remarks, when the Society commenced the regular routine of business.

The following resolutions were then introduced by Dr. L. H. Orme, of Atlanta:

Whereas, According to Article 1, Code of Ethics of the American Medical Association, "Every individual, on entering the profession, as he becomes entitled to all its privileges and immunities, incurs an obligation to exert his best abilities to maintain its dignity and honor, and to exalt its standing;" and

Whereas, According to Article 4 of said Code of Ethics, "a regular medical education furnishes the only presumptive evidence of professional abilities and acquirements, and ought to be the only acknowledged right of an individual to the exercise and honors of his profession;" therefore,

Resolved, That while the fact is recognized that there are in our midst medical practitioners worthy, talented, and useful, who, from lack of means, or other cause, have failed to obtain a diploma, yet as the earning of the Degree of Doctor of Medicine furnishes the only presumptive evidence of a regular medical education, the Georgia Medical Association, fully alive to the honor, dignity, and true interests of the profession, deems the admission, in future, of non graduates to membership a violation of the spirit which governs the Code of Medical Ethics.

Resolved, That hereafter no individual shall be entitled to membership in this Association who has not received the Degree of Doctor of Medicine from some medical school of known and acknowledged respectability, and as such recognized by the American Medical Association.

Resolved, That the portion of the constitution which provides for the admission to membership in the Georgia Medical Association of State Licentiates be stricken out.

After some discussion, action was postponed until the morning session.

Adjourned till 9 o'clock to-morrow morning.

SECOND DAY.

9 o'clock, A. M., April 11.

Meeting called to order by the President.

Minutes read and adopted.

The order of business was then suspended for the admission of new members, when Dr. L. Strozier, of Albany, was presented, vouched for, and elected.

Several resolutions were introduced and adopted.

Order of business was suspended, and R. V. Reid, M.D., was presented, vouched for, and elected.

On motion of Dr. Westmoreland, a committee was appointed to revise the constitution.

On motion of Dr. Griggs, a committee was appointed to report the Medical Topography of the State of Georgia.

Also, a committee to report on the medicinal properties and uses of the various unofficinal indiginous plants of the State of Georgia, and other States that they may be acquainted with.

Several resolutions were then introduced and adopted, among which were the following by Dr. Simmons, of Atlanta:

Resolved, That the members of this Association highly appreciate the cordial welcome they have received on the part of the city authorities of Griffin, and that their thanks are due and are hereby tendered to the citizens, and especially to the ladies, for their kind offices in contributing to the pleasures of this body during its session in Griffin, in furnishing such entertainments as are ever agreeable, and which are esteemed as evidences of kind feeling and good will to the profession; and

Resolved, That the thanks of this body are tendered to the vestry of the Methodist Church for the use of their Lecture Room for its deliberations.

Reports from the different committees were then called for and received.

On motion of Dr. Ray, of Atlanta, Dr. Thomas, of Savannah, was elected orator for the next annual meeting.

The rules were then suspended, and Dr. W. H. Touchstone elected a member.

The following resolution was presented by Dr. Banks, and adopted:

Resolved, That the thanks of the Association be tendered to the following Railroads of Georgia, which have kindly made concessions in favor of members of said Association, viz.: Georgia Railroad, Central Railroad, Macon & Western Railroad, Augusta & Savannah Railroad, Western & Atlantic Railroad, Albany & Gulf Railroad, and Macon & Brunswick Railroad.

Upon motion, Dr. DeS. Ford, of Augusta, was appointed Chairman of the Committee of Arrangements for the next annual meeting, to be held at Augusta, Ga.

On motion, the report of the late Treasurer was received, and ordered to be placed on the minutes.

On motion of Dr. W. F. Westmoreland, it was

Resolved, That in the opinion of this Association, there is no breach of the code of Medical Ethics which governs the profession, in physicians contracting with the owners or agents of plantations for the treatment of freedmen in their employ. Provided, that in each city, county, or neighborhood, uniformity of charges be observed, and underbidding avoided.

On motion of Dr. Word, Dr. H. L. Wilson, of Atlanta, late Treasurer, was called upon for a full report.

On motion of Dr. Holt, of Macon, a vote of thanks was tendered to the Recording Secretary and Treasurer for the prompt and efficient manner in which they discharged their duties.

Upon motion of Dr. Crawford, of Atlanta, the proceedings were ordered to be printed in the SOUTHERN MEDICAL AND SURGICAL JOURNAL of Augusta (the organ of the Association), and all other medical journals in the State.

There being no further business before the Association, upon motion it was adjourned to its next annual meeting on the second Wednesday in April, 1868.

L. H. ORME, Secretary.

WORKS RECEIVED.

Watson Abridged; a synopsis of the Lectures on the Principles and Practice of Physic. By Thomas Watson, M.D., F.C.P., etc., etc.; abridged from the last English edition, with a concise but complete account of the properties, uses, preparations, doses, etc., with other valuable additions, by J. J. Meylor, M.D. Philadelphia, 1867; 12mo., pp. 276.

Injuries of the Spine, with an analysis of nearly four hundred cases. By John Ashhurst, Jr., A.M., M.D., Fellow of the College of Physicians of Philadelphia, etc., etc. Philadelphia: J. B. Lippincott & Co., 1867; 12mo., pp. 130.

Cerebro-Spinal Meningitis; being a report made to the Illinois State Medical Society, June, 1866. By J. S. Jewell, M.D., Professor of Anatomy Chicago Medical College, etc. Chicago: G. H. Fergus, 1866; pp. 68.

Two Cases of Œsophagotomy for the Removal of Foreign Bodies, with a history of the operation. By D. W. Cheever, M.D., Assistant Professor of Anatomy in Harvard University, etc. Boston: D. C. Clapp & Son, 1867.

Researches upon Spurious Vaccination; or the abnormal phenomena accompanying and following vaccination in the Confederate army during the American civil war, 1861–1865. By Joseph Jones, M.D., Professor of Physiology and Pathology in the Medical Department of the University of Nashville, Tenn. 1867.

Tableau of the Yellow Fever of 1853; with Topographical, Chronological, and Historical Sketches of the Epidemics of New Orleans since their origin in 1796, illustrative of the quarantine question. By Bennet Dowler, M.D., etc., etc. New Orleans, 1854.

Remarks upon Compound Fractures of the Thigh from Gunshots, treated at Chimborazo Hospital, Richmond, Va. By S. E. Habersham, M.D., of Augusta, Ga. 1867.

A Letter of the Corresponding Secretary of the New York State Inebriate Asylum, to Hon. E. D. Morgan, Governor elect of the State of New York. 1858.

An Appeal of the Trustees of the Inebriate Asylum, to the Churches of the United States and the American public, in behalf of that Institution.

Annual Report of the City Registrar, comprising return of deaths, etc., for the year ending December 31, 1865. Charleston, S. C.: 1866.

Essay on Phosphate of Lime. By E. N. Chapman, M.D., etc.; with notices of its forms of preparations, etc. By C. Mack & Co., New York: 1865.

Bulletin of the New York Academy of Medicine. Vivisection: What it is, and what it has accomplished. By J. C. Dalton, M.D., Professor of Physiology in the College of Physicians, New York. Balliere Bros., 1867.

Fourteenth Annual Report of the Pennsylvania Training School for Feeble-minded Children. Philadelphia, 1867.

American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. Philadelphia.

Atlanta Medical and Surgical Journal. Edited by Drs. J. G. Westmoreland, W. F. Westmoreland, and J. M. Johnson.

Boston Medical and Surgical Journal. Edited by Drs. S. L. Abbot and Luther Parks.

Buffalo Medical and Surgical Journal. Edited by J. F. Miner, M.D.

Cincinnati Lancet and Observer. Edited by Drs. Stevens, Murphy, Mussey, and Williams.
Medical and Surgical Pioneer. Edited by J. Keller, M.D. Kansas City, Mo.
Nashville Journal of Medicine and Surgery. Edited by Drs. Bowling, Eve, Jones, and Blackie.
New Orleans Medical and Surgical Journal. Edited by Drs. Stone, Jones, Herrick, Chaille, and Nichols.
New Orleans Southern Journal of the Medical Sciences. Edited by Drs. Brickell, Beard, Mitchell, Perry, and Holt.
Revue de Therapeutique Médico-Chirurgicale. Par A. Martin Lauzer. Paris.
University Journal of Medicine and Surgery. Edited by W. Payne, M. D. Philadelphia.
American Naturalist. Salem, Mass.
Braithwaite's Retrospect.
Chicago Medical Examiner. Edited by N. S. Davis, M.D.
Dental Cosmos. Edited by Drs. McQuillen and Ziegler. Philadelphia.
Dental Register. Edited by J. Taft and G. Watt. Cincinnati.
Galveston Medical Journal. Edited by G. Dowell, M.D.
Medical News and Library. Edited by J. Hays, M.D. Philadelphia.
Medical and Surgical Reporter. Edited by S. W. Butler, M.D. Phila.
Medical Record. New York.
Ranking's Abstract. Philadelphia.
Richmond Medical Journal. Edited by Drs. Gaillard and McChesney.
St. Louis Medical Reporter. Edited by Drs. Alleyne and Potter.
Transactions of the College of Physicians of Philadelphia.
The Druggist's Circular and Chemical Gazette. New York.

FACULTY OF THE MEDICAL COLLEGE OF GEORGIA, AT AUGUSTA.

I. P. GARVIN, M.D.,
Emeritus Professor of Materia Medica, etc.

L. D. FORD, M.D.,
Professor of the Theory and Practice of Medicine.

JOSEPH A. EVE, M.D.,
Professor of Obstetrics and the Diseases of Women and Infants.

L. A. DUGAS, M.D.,
Professor of the Principles and Practice of Surgery.

H. F. CAMPBELL, M.D.,
Professor of Operative Surgery and Surgical Anatomy.

G. W. RAINS, M.D.,
Professor of Chemistry and Pharmacy.

EDWARD GEDDINGS, M.D.,
Professor of Physiology and Pathological Anatomy.

DeSAUSSURE FORD, M.D.,
Professor of Anatomy, general and descriptive.

WM. H. DOUGHTY, M.D.,
Professor of Materia Medica, Therapeutics, and Medical Jurisprudence.

JOHN S. COLEMAN, M.D.,
Demonstrator of Anatomy.

L. A. DUGAS, Dean.

THE TRUE PHYSICIAN:

AN ADDRESS

DELIVERED BEFORE THE GRADUATING CLASS OF THE MEDICAL COLLEGE OF GEORGIA, AT ITS

ANNUAL COMMENCEMENT, MARCH 1st, 1867.

BY REV. HENRY H. TUCKER, D.D.,
President of Mercer University.

PUBLISHED BY REQUEST.

AUGUSTA, GA.:
E. H. PUGHE, BOOK AND JOB PRINTER.
1867.

ADDRESS.

Gentlemen of the Graduating Class:

The most recently-elected member of the Board of Trustees of the Medical College of Georgia, I nevertheless think that I may claim for myself that none can exceed me in the interest which I feel in the success of its graduates, and in the prosperity and progress of the noble science of Medicine. When I first saw the light, it was the hand of the Physician that received me, and welcomed me to life. Can I ever forget that humane profession which was my earliest friend? In my childhood I was guided through fearful perils by its wise councils; it watched by my bedside, and more than once rescued me from the jaws of death. In my earlier manhood, when smitten to the vitals and apparently not far from the grave, I called for relief on the medical profession, the friend of my childhood, and to it I suppose I am indebted, under God, for the breath I now draw, and for the power that enables me to address you. Can I ever forget my obligations to medical science as long as I have a heart-throb, when I know that in the Providence of God, every throb is its gift?

I have seen one of my little ones paling under disease, and just ready to fall into the embrace of death, when the man of science came and put roses on the cheek of my cherub, and brightness in his eye, and restored him I had almost said to life, certainly to health and to me. Can I ever cease to honor and love that profession which gave me back my boy when I thought he was gone?

Once one of your own Faculty (can I ever forget him) by his very smile, by his mere assurance that there was nothing the matter with that organ which seems to be the fountain-head of life, that the wheel was not broken at the cistern—so inspired the confidence of one very dear to me, and so quickened her *spirituelle*, that from that hour, without prescription—and from the mere operation of subjective forces, there began an improvement that hastened on with almost miraculous speed to perfect health; illustrating at once the power of mind over matter, and the power of that profession, whose listening ear applied to the chest, eavesdropping at the door of nature, catches the *secrets* of nature, and which repeats them, in no doubtful words as mere matters of opinion,

but with the calm certainty of an exact science. Can I ever pay the debt I owe to that science? If it can so arouse the *vis medicatrix naturæ*, and set its forces in operation by a word, does it not remind one of the deeds of the Saviour who only spoke, and disease gave way to health at the omnipotent word?

O, Genius of Medical Science, I honor thee! Thou hast given me my children—thou hast sustained my wife in her perils—thou wert my earliest friend—thou wilt be my last—when I lie upon my latest couch thou wilt be there to smooth with thy gentle hand my dying pillow! To thine altar, O thou benefactor of mankind! I bring this offering of an appreciative and grateful heart.

And now, gentlemen, having said what I trust will be a passport to your forbearance, will you allow me, as one of the Curators of your *Alma Mater*, to give you a few words of counsel as you are about to depart from its halls and enter upon your professional career. Perhaps these words would have come better from one of your medical instructors; but as by their request, this service is to be performed by me, you will at least learn from this that others besides themselves are interested in your personal welfare; that others besides themselves cherish the profession of the healing art. Instructions coming from them, on this occasion, might have the appearance of being merely professional. I speak to you not as a physician, but as a man: It may be well for you to know how your profession looks to an *outsider*, and to receive some counsel from one who has no connection with the science or with the practice of medicine, except to receive its benefits.

Your eye is now fixed on professional success. How is that success to be achieved? That is the great question. Perhaps I can best develope what I have to say by giving counsel of a negative character. Let me tell you what will *not* succeed—a life of indolence. No man can be a physician, in any proper sense of that term, without being a habitual student. Your present attainments are sufficient with which to *begin* life, but they are not sufficient to carry you *through* life. No man at your age ever could know as much as he ought to know when he is twenty years older, or *one* year older. If it takes, as Blackstone says, the *viginti annorum lucubrationes*, to make a lawyer, it takes at least as long to make a physician. What immense fields of inquiry medical science opens before you. When you shall have been gathered to your fathers, and when a hundred generations of physicians shall have followed you to death, those who are then alive upon the earth will not have reached the boundaries of science. Your short life will reach but a little way toward those boundaries. Think of the two or three years that you have spent in studying medicine, and imagine *that* to be all the time to be devoted to it, and your present knowledge to be not the beginning but the conclusion of your attainments! Nor are these counsels needless. There are men claiming to be physicians who seem to think that a

diploma is a license to indolence, and that, having once graduated at a Medical College, they are free from all further obligations to pursue the science. There are men who have grown gray in the service, who are now practicing medicine on the old effete systems which were exploded thirty years ago! There are men whose medical knowledge was as great the day they graduated as ever afterwards, and who having fallen into a certain routine, practice medicine by receipts, such as might be found in an almanac. A discredit to the profession, and an imposition on the public are these mountebanks; and it is to be regretted that the strong arm of the law can not reach them and punish them for obtaining money on false pretences, and for criminal trifling with human life. A man has no right to remain in the medical profession and accept its emoluments and its honors unless he is willing to discharge its duties; and its highest duty perhaps is the duty of continuous, unremitting hard study. Gentlemen if you are not ready, here on this altar, to pledge your vows to be consecrate to medical science, you ought even now to surrender your diplomas back to the authority whence they came.

When I speak of study I refer to *books*. Men of indolent habits sometimes pretend to excuse themselves from the study of books on the ground that their minds are engrossed with the nobler business of studying *things*. Even if there were truth in this apology, which is seldom the case, it would not be satisfactory. No man's life is long enough to master the study of things without the study of books. By availing ourselves of the labors of others, we can begin our researches where they have left off, and use their experience as a springing-board from which to leap out farther into the regions of the unknown. But for this, each generation and each man would have nothing but the experience and the knowledge of the individual, and the wisdom of the race *as such*, could never be attained, and we should reduce ourselves to a level with brutes, each one of which may learn his lessons and his tricks, but can not teach them to his offspring.

All human knowledge is in books. To repeat the same thought in other words—a man who knows all that there is in books, knows all that is known to the human race. When there are such treasures on our shelves, how preposterous are the pretensions of those who ignore them or claim to be above them. Think of a man, perhaps of shallow attainments, *of course* of shallow attainments, and of shallow brain, setting up his narrow observation and his worthless judgment against the combined wisdom of the world. When I speak of books I refer to the standards, to those that have become classic, and are regarded by the profession as authorities. Many of them are old, but in some respects they will never be out of date. Yield not, gentlemen, to the temptation of all times, to look down with supercilious eye on the wisdom of the past. Having said this, it is necessary to make a counter remark to guard against the opposite error. Let not the old authorities be regarded

as infallible, nor let them be the only objects of your study. There is always in every science, and particularly in medicine, a current literature, without familiarity with which a man can not keep abreast of the times nor fully up with his profession. If you were even masters of all that is in the books *now* in print, and were to learn no more, you would find yourselves in twenty years, or even in ten years, or in five, practicing on plans which by that time will be inferior to those which the world will then have discovered. In short you never can succeed as true physicians without a knowledge of things both new and old, which can be found only in the current and in the classic literature of your profession. Here too, I must put in another *caveat.* While it is necessary that you should use books, you must be careful not to let books *use you.* Books are intended to aid your judgment, not to supercede it. If we tie ourselves to what is written, we shall never rise above what is written ; and in that case no more can ever be written ; progress will cease, and our attainments in knowledge while very limited will still be concluded, and coming generations will be in the hands of men long dead and forgotten. This is not the use of books ; it is the abuse of them. They were never intended to destroy independence of thought, but to stimulate it. We must remember that books contain, for the most part, only general principles ; not the application of them. Each case must be judged of on its merits, and by its own idiosyncracies ; hence, a man who attempts to practice medicine by a *book,* as some so-called doctors *do,* is not worthy the name of a physician. A good book is a great thing, but it is no substitute for a living, human brain. Gentlemen, you can never succeed as mere book doctors. This leads me to remark, in addition, that there can be no true success without the study of things. With book in hand to aid you, let your eyes be turned to the facts of nature ; investigate the phenomena themselves—not merely what others have *said* about them, and make yourselves masters of the present situation. Thus only can you have any opinions which can properly be called your own. There can be no genuine success without original research.

You must remember, too, gentlemen, that however arduous your studies, both of books and of things, you can not succeed without diligent attention to your profession as a *business.* The call, however inopportune, must be attended to promptly—the service, however disagreeable, must be rendered faithfully. When not at the bed-side of your patient, or on the way to it, your office is the place for you, not the street-corner. It must be known where you may be found, and that always at a moment's warning (except when engaged with your patients) your services may be obtained. Many a young doctor has made shipwreck of his fortunes by dilatory response to professional calls, by negligent and careless habits, and by being often seen in places of idle gossip, where a man of business ought not to be. As for the physician who is greatly given to amusements, who must finish his game of cards

or of chess before he can respond to the call of a patient, who is a habitual frequenter of theatres or similar places, or who spends much of his time gun in hand, indulging in the sports of the field, I need not say that he can anticipate nothing but miserable failure. The true physician is never a man of pleasure. Still less need I say that the physician who is given to habits of dissipation, who approaches the bedside with nerves trembling or mind beclouded by the influence of strong drink, can not succeed, and ought not. If there is a man on earth who above any other ought to be sober and always clear-headed and cool, it is the man who holds the lives of his fellow-men in his hands. It may be more needful to say, that if you would meet with the highest degree of success, you must have no other business but your profession. Few men can attend to more than one thing at a time, and any man who makes of himself a good *physician*, has done as much as can be expected, or as is possible. All the energy devoted to another business is that much taken away from this, and as all your power is none too much, any less than all is that much too little; you have robbed your profession of that much which was its due, your patients of that which they had a right to claim, and yourself of a certain degree of success, reputation, and real merit.

I must mention, too, that there are surreptitious and unprofessional methods of attaining to success of a certain kind, which we trust that all our alumni will avoid. There are those who advertise their merits as merchants do their goods, reducing their talents to the mean level of merchandise, and who immodestly make great promises through the newspapers to cure all diseases, and who publish certificates of wonderful cures performed by them when all other physicians have failed; whose look dries up dropsies, whose touch cures cancers, and whose surgical skill is ready for any operation, if it were even to cut off and tie up an aneurism of the aorta. The true physician never boasts, never claims superiority to others—above all, he never claims to do what is impossible to be done, and has no use for a newspaper as an advertising medium, except to let his place of residence be known, and even for this only in case of removal. The physician who figures in the public prints may meet with success, but it is the success of the charlatan—it is a success for which he exchanges the respect of his professional brethren and the confidence of the thinking part of the community.

Nor should there be any private electioneering for patronage. The man who goes about seeking patients, proves, by that very fact, that patients do not seek him, and that is the very best evidence that he is not worth seeking. Above all should there be no endeavor to obtain practice by detracting from the professional skill of another physician. No success can be gained by this in quarters where success is desirable, for such conduct proves not only that the guilty man is essentially worthless, but also that he is essentially mean. Let there be no spoken nor acted inuendo, not even, if possible, any suggestive silence in regard to the

doings of another physician, such as might turn patronage from him to you. You can better afford to do without patronage than to obtain it on dishonorable conditions.

Another means of success resorted to by some, a means worthy only of the meanest of mankind, is that of underbidding the profession and offering to practice at reduced price. Nothing can be more unprofessional, nothing can be more contemptible. As I am not a physician, but have constantly to employ them and to pay them, I shall have credit for sincerity when I say that I look with scorn upon a man who is willing thus to degrade his own profession by letting its practice out to the lowest bidder. If he has no respect for his profession I have none for him; and I take it for granted, moreover, that if he values his own services at less than that of others it is because they are worth less; and when my life and health are at stake I want the best. The expense in dollars and cents is but a poor item in comparison with the interests I have at stake. The man who offers to practice for me at half price could not practice for me at any price. Owing my life to the medical profession I owe it too much to be a party to its degradation. Such, too, ought to be the sentiment of the community. If one mountebank is patronized because he makes a low bid, another one may come who will bid still lower, and another lower still, until at last men of science will be driven from the profession, and it will fall into the hands of quacks and murderers, who for the sake of money, and that in pitiful sums, will trifle with the lives of their fellow-men as if they were toys. Society owes it to itself as a matter of self-preservation to banish and proscribe these mercenary enemies of mankind. Cheaper far to pay high rates for good physicians than to have bad ones for nothing. It is the duty of the patient to pay his physician's fees promptly, cheerfully, and gratefully; and it is your duty, gentlemen, to make your services worth to your patients more than they cost them. You should remember, that the value of professional labor is not to be estimated by the poor standard of money. If it is worth only *as much* as it costs it is worth nothing.

There is another way of achieving a certain kind of success, which may or may not be dishonorable, but it is always either dishonorable or the result of narrow views.

There are those who adopt a pet theory or a pet remedy, and, losing sight of everything else, magnify its excellencies, and by pushing it vigorously, and making much ado about it, succeed in attracting the attention of the gaping multitude, who are called upon, in due time, to pay heavily for their own misfortune in being duped. Sometimes shrewd and unscrupulous men get up some catholicon which professes to be good for all the diseases in the world, with the express intention of deceiving the unwary for the sake of gain. More frequently in private practice, a man, from mere mental smallness, becomes filled with one idea—his

mind is large enough to hold but one, and there is scarcely a form of disease to which he does not contrive to apply his favorite remedy. Such physicians are like Dr. Sangrado, of Spanish memory, whose great remedy for all human misfortunes was blood-letting and warm water. For diseases arising from plethoric habit and requiring antiphlogistic treatment, he prescribed, not with any view to the facts of the case, but simply because it was his habit, blood-letting and warm water. If a man were fainting from diminished vitality, from a letting down of all his forces, arising from insufficient nutrition or like cause, his remedy was still blood-letting and warm water; and if the patient grew worse it was plain that the treatment was not vigorous enough, and he must have more blood-letting and warm water. There is many a Sangrado among us, who, if his remedy is not blood-letting and warm water, has some other hobby which is equally unfortunate. Sometimes instead of warm water and blood-letting, it is steam without the blood-letting; sometimes it is cold water; sometimes it is a drug, which he expatiates on the wonderful virtues of until the very mention of it becomes an emetic; sometimes it is the absence of all drugs except the millionth part of an atom; and, indeed, if a man has determined to practice wholly on one idea, this is certainly the most harmless that he could possibly adopt. But aside from these which have become popular hobbies, any practitioner is liable to fall in love, as it were, with certain plans which he has seen succeed, and persist in them afterwards, because he is convinced that they ought to succeed, even if they *do* not. Little as you may think of it, gentlemen, it is only by effort that you can keep out of a routine which will eventually become a hobby.

Another fictitious success is sometimes achieved by means the opposite of this, when men profess to practice on eclectic principles, and pretend to combine theories which are antagonistic. I will not say of these tricks that they are merely unprofessional; it is but doing them justice to say that they are disgraceful.

One other unworthy resort only will I mention. Sometimes a physician discovers, or thinks he discovers, a new and valuable remedy, and instead of giving it to the world, he applies to the *Patent Office*, and thus sells himself as well as his physic, for money. A man is a traitor to his profession who thus keeps a secret from it which never kept a secret from him. The world has poured out at his feet all its treasures of scientific knowledge, and he is not willing to give in return the single iota or discovery which he may have made. There is a vile ingratitude in it, and a base disregard of the claims which humanity has upon all who can relieve its woes. If his remedy is valuable, he is defrauding the world by keeping back the secret; if it is not valuable, he is taking the people's money without giving them an equivalent. The true physician does nothing in a corner. The profession of medicine has no secrets.

Whatever it does, it does for the world. Her's is a pure disinterestedness, a broad philanthropy, and a generous hand.

But I have given cautions enough, and pursued the negative line of thought perhaps too far. Let us take more positive views and answer the question, so practical a question with you, gentlemen—how is a genuine success in medicine to be legitimately achieved?

An eminent jurist once said to a young man about to enter the profession of law: "If you want to succeed, make yourself *necessary*—make yourself such a lawyer that no man involved in litigation can afford to do without you: make every man feel that he must have your services." Gentlemen, I can not improve on this advice. Make yourselves a necessity to the community where you reside. Make yourselves so thorough in your profession that no man in reach of you can afford to do without you. Have no fears that your merits will remain long undiscovered. You could not keep them secret if you would. The world has a way of finding out where the good lawyers and where the good doctors are, and there are always enough people in the world who desire able professional service to sustain all who are worthy of being sustained. Have no fears of competition. Make yourselves what you ought to be, and you might open your humble office in this very city, in the midst of the distinguished men who have been your instructors in medicine, and in due time you would take your proper rank and receive your full share of the practice. It is unmanly to fear competition. Never run away from it. Rather court it; and the more able it is, the more it will develope your own manhood, and add to your mental power and professional ability.

I said, gentlemen, in my opening remarks, that your eye is fixed on success, and that that is now the great object of your lives. Let me now rise on this thought and take a superior view. It may be that success *is* the great object of your life, but let me assure you that it *ought not* to be. Is a man true to his profession who studies it only in order that *he* may succeed; whose motive is either mercenary or ambitious, in either case personal and selfish? If a man studies even logic or philosophy merely for the sake of the money that he can make out of it, or for the reputation that he may achieve by it, and not for the love that he has for it, he ought not to succeed if he does, and he never will succeed in commanding respect nor in holding honorable rank among men of letters. The true soldiers of science, of *any* science, are all volunteers, and enter the service from enthusiasm in the cause, and not as conscripts drafted into the service by necessity, nor as hirelings paid by the day. Such hirelings as these are but a wretched substitute for the true soldier moved by nobler impulses, nor is it likely that they will achieve any great distinction, or wear many of the laurels. When they have obtained the dollar, which is all that they came for, they will leave the field, and retire to some obscure corner to count over their gains. But if it be

unworthy of any profession to use it as a mere means of making money, it does seem to be especially so in the humane profession of medicine. The practice of such a profession ought to develope the tenderest and the noblest elements in our nature. What a shocking prostitution when its almost sacred duties are performed from mere cupidity. Just think of a man endeavoring to mitigate a human pang, or save a human life, from no higher motive than that he expects to get a dollar for it! Oh, should I see such a creature standing by the bedside of one dear to me, how quickly would I wish to thrust him out of doors. The case would be equally bad, though not quite so disgusting, if his motive were personal distinction. Gentlemen, a success which is *aimed* at, is not a true success when it is attained. That only is a genuine success which comes unsought—which is the result not of efforts to obtain it, but the result of ardent zeal and of a consecrated life. He only is a professional man who studies his profession from the *love* of it—who makes it an *end*, not a means. The man who is not in love with his profession, and who does not throw himself into it with the glowing enthusiasm of a *youthful* lover, and pursue it for its own sake, regardless of its revenues of emolument or of glory, is not worthy of it, and ought to be spurned from its brotherhood. Gentlemen, if you are not willing to devote yourselves to medicine for its own sake, and for nothing else, I beseech you to lay down your diplomas as soon as you have received them, and enter upon some business that *can* inspire your zeal. Marry your profession; marry it not for its money, but for itself, and success, brilliant and enduring, though unsought, will be won, and it will bring honors with it such as none can wear but the *true physician.*

Your great object should be not to achieve personal success, but to discharge personal duty, leaving results to take care of themselves. In order to do your duty as true physicians, there are several things which should be borne in mind, some of which I shall mention.

Remember, in the first place, that your profession is *progressive.* What wonderful developments have been made in medical science in the last thirty years. In that time the art of auscultation has done its work. True it was germinated by Lannaec some years before, but it is only recently that it has fructified and brought such abundant fruit. Who would have thought, thirty years ago, that the first indication of a new life coming into the world would address itself to the *ear?* For nearly six thousand years nature had been whispering as distinctly as now, "Another soul is coming," but it is only recently that we have caught the whisper. How astonished the Frenchman just named would be to know this surprising result of his own theory.

What an immense amount of human agony has been saved by the anæsthetic agents now in almost universal use. The knife of the surgeon glides through the quivering flesh without even disturbing the sweet slumber of the sleeper. The curse pronounced upon woman is

half removed, when, in the last agony, she passes off into sweet unconsciousness, while the muscular contractions needful to her relief go on undisturbed. But a few years ago these wonders of science were unheard of. More recently means have been discovered of producing local anæsthesia, without affecting the general system, and I learn from our best surgeons that the practice is a perfect success. How speedy the action of remedial agents introduced directly into the circulation; and if this hypodermic mode of treatment is not very general, and indeed not usually proper, it may yet lead to great results, and in certain cases save life where no other treatment would avail. The application of organic chemistry to medicine, with its multiform results, is but a recent thing; the medical uses of the microscope are an era in the science, and it is a thing of yesterday. In the preparation of medicines, many improvements have been introduced, almost as great as the improvement of quinine on peruvian bark. Some of the most valuable and popular articles of our present materia medica, as, for example, iodine, the great sorbefacient in its various combinations, were wholly unknown but a very few years ago. In the department of surgery, too, new operations are performed far superior to those formerly in use. What a blessed thing for woman that ever Dr. Sims, of Alabama, originated the operation now in use for vesico-vaginal fistula, the result of which is that success is the rule, and failure the exception, instead of the reverse as was formerly the case. His silver cord is almost like that of which the prophet speaks—the cord that binds to life.* But, it is needless, gentlemen, for me to be recounting to you the improvements in the healing art, when they are much more familiar to you than to me. It is only a little that I know of these things—the little that I have picked up in general reading and observation, whereas, you, of course, know all about them. But I briefly allude to these things, simply because they suggest that, if your profession *has* been progressive, so, also, it *will* be, and that it is your duty not only to *keep up* with this progress, but to contribute to it. Shall the profession do all for you while you do nothing for it? Are you to be carried as so much dead weight in the car of progress instead of being one of those whose power propels it? No man is fit to be a physician unless he at least has desires and makes efforts to improve his profession. Allow me here, however, to caution you against an error into which an overweening desire for progress is liable to lead you. Yielding too much to this spirit you are apt to seize upon all novelties as improvements. You should remember, gentlemen, that where one of the novelties proposed is a real improvement, a dozen or fifty of them may be fictitious, and that it requires a wise discrimination, and a mind fully awake and in the highest activity, to be able to distinguish between them. The general tendencies of your minds should be sober and con-

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*It is but justice to Dr. Bozeman, of Columbus, Ga., to mention his improvement on Dr. Sims' method.

servative. Be not in haste to accept every so-called improvement, nor to fall in love with every upstart theory that may thrust itself upon public attention. The safest physicians are those who hasten slowly. With all such, there is a philosophic reluctance to accept novelties in science. The philosopher knows, in the first place, that many of these things are not novel, but are the mere ghosts of follies, killed in conflict with truth long ago, and now returned to visit the scene of their discomfiture. He knows, in the second place, that admitting them to be really new, they are only *efforts* of the human mind at improvement; that many of these efforts are made by ignorant men, who are capable of nothing but blunders, and that even if made by the best of men, there must be many efforts made to every success achieved; in other words, that in pushing our investigations even with the most philosophic spirit, we make many more failures than successes, and that, consequently the chances are always largely *against* a novelty being an improvement. Hence the true philosopher is reluctant to accept novelties, and never does accept them except after patient inquiry and fair trial. But having said this, it is necessary that I should caution you against the opposite extreme. There is such a thing as unphilosophic reluctance to accept novelties; and perhaps the Faculty will pardon me if I say that we outsiders sometimes think that the medical profession is peculiarly slow and sometimes almost culpably tardy in accepting real improvements on established practice. There is a pride in the profession which prompts it to reject anything that does not originate with itself, reminding us of him of whom Terence speaks, when he says: "*Imperitus, nisi quod ipse facit nihil rectum putat.*" But it would be more in keeping with the characteristic magnanimity of the profession if truth and facts were accepted, no matter where they come from. Sometimes discoveries made even by members *of* the profession, are for a long time rejected *by* the profession. It was a long time before Harvey was forgiven by his brethren for having discovered the circulation of the blood; and Jenner suffered no small persecution for his sublime achievement in depriving small-pox of its terror. How ridiculous a figure do these old opponents of novelty present to the present generation. Be careful, gentlemen, not to place yourselves in the same attitude, for coming generations will review your conduct, and hold you to account for any unphilosophic opposition which you may have made to progress.

In short, there is a golden mean to be pursued. On the one hand be not carried away with every wind of doctrine; on the other hand be not stubborn—be not even tardy to accept facts, when well-established. If your theory is contradicted by facts, let it be so much the worse for your theory; and do not say, as I have heard that a man once said, "So much the worse for the facts."

Remember, gentlemen, that it is for you of the medical profession to decide questions of this kind for the whole world, and that it requires a

mind well balanced, ever active, and thoroughly trained, to be adequate to such responsibilities. Study with these objects in view, without regard to personal success, which should be but a feeble motive by comparison, if indeed it is not an unworthy one.

This reminds me to say that you should ever bear in mind the responsibilities of your profession. One of these I have just referred to. Now, more particularly let me say, that the lives of your fellow-men are in your hands. Oftentimes a man's life hangs by a hair, and the keen edge of your knife is on that hair. The least trembling of your nerve might be fatal to him. I refer, not as my figure would seem to indicate, to surgical practice alone. You may stand by the bedside when the least disturbance of your mental equipoise may be the death of your patient. Perhaps from careless observation, or from careless reading, or neglect of reading, you are ignorant of a certain item which an accomplished physician ought to know. That ignorance may be the negative cause of a hundred deaths. It is a fearful thing to be thus fatally ignorant, shall I not say *murderously* ignorant. What a powerful stimulant to a life of study and of consecration to medical science is such a consideration as this; and how the thought of mere personal success dwindles to insignificance by comparison.

Be ever-mindful also, gentlemen, of the dignity of your profession. Dignified because of the objects which it proposes—the alleviation of human suffering and the lengthening of human life. Health and life are the two great blessings without which all other temporal gifts cease to be blessings, and of these two greatest treasures of the human race, you are the conservators. Dignified, because of the motives in which it had its origin, and in which lies its life. Benevolence is the fountain-head from which the stream of medical science flows; if there had been no such thing as a loving heart in the world—a heart that throbbed for humanity, the healing art would have been for ever unknown. And to the honor of the profession be it said, that the pure, the noble, the god-like motive which gave it existence, has ever been kept in lively exercise by its members. There is none so poor but that he can command, as indeed he ought, the very best medical attention. The miserable mendicant in squalid cabin, needing surgical aid, can secure it from the same skillful hand, or needing medical advice, can have it from the same accomplished sources as the wealthiest men in your city. Freely and without price are blessings thus doubly priceless bestowed by the profession on the poor. And even where poverty is not extreme, and where practice on the mere ground of charity would scarcely be acceptable, there are few of the honorable and humane profession who do not know how, delicately and generously, to diminish the bill and accept the semblance of payment for what is virtually a gratuity, thus enacting a double benevolence—first in conferring the favor, and afterwards in accepting insufficient

remuneration as if it were sufficient, to save the feelings of the beneficiary. Gentlemen, I trust that you will keep up the honor of your profession in this regard, and while, as already said, you should never undervalue your services for the sake of extending your practice, on the other hand be mindful of the necessities of your patients—give no place to cupidity, remembering that the *emoluments of your profession are only its incidents, and not its objects*—that its great object is to *do* good, and not to *get* it. Remember this dignified, this exalted position of the profession and ever maintain it.

Dignified is your profession, also, because its deeds are like those of the Saviour of mankind. He came to save life, not to destroy it. He went about doing good, doing good to the *bodies* of men as well as to their souls. There were brought unto Him all sick people, and those that were taken with divers diseases and torments, and He healed them all. The palsied trembler walked away with firm step as well as light heart; the poor leprous wretch was made sound and whole; the emaciated form of smitten childhood was restored to its plumpness—its blanched cheek to its bloom; the hearts of the afflicted were made glad by the Great Benefactor, by the Great Physician who scattered blessings with a hand as generous as it was omnipotent. It is a great thing to be engaged in the same work with Jesus of Nazareth. Remember, gentlemen, who it is that stands at the head of your profession; and I would that while your work is like His, your motives might be as noble, as disinterested, and as pure. Your professional life requires you, that far, at least, to be like Jesus. I would that you might be like Him in all your inner life.

And now, gentlemen, I must bid you adieu. I wish you all personal success. I wish you *more* than that—I would that each of you may be a true physician, and that is the highest wish, of temporal nature, that one can make for you. When you are sick, I trust that some true physician may stand by your bedside to do skilfully for you what you have done for others. When you come to die, I trust that some true physician may be there, not to deceive you with false hopes, which a true physician never does, but to make your dying easy. I trust, above all, that your spiritual health may be in the keeping of the Great Physician, and that He may give to each of you eternal life. When you have finished your humane and philanthropic work, and lay your bodies down, let there be many tears shed by grateful patients over the grave of the much loved family physician; and may your spirit be received to the bosom of Him who is the father of your profession, as He is of all that is good. In that blessed world you will cease from the labors of your calling here, for there "the inhabitants never say that they are sick," but you will still retain its motive—its motive is love—and for ever enjoy the rewards of a well-spent life.

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On the Treatment of Fractures of the Femur; read before the Medical Society of Montgomery. By William J. Holt,* M.D.

Montgomery, Ala., Feb. 4th, 1867.

Having recently had an opportunity of testing the efficacy of an apparatus of my device—or if you will, my modification of an old apparatus—I have thought that an examination of it by you, with a discussion upon the mechanical treatment of fractures of the femur, would not be uninteresting. I do not claim perfection for this apparatus, but improvement, and hope that your criticisms will be free, and that I may elicit something in the discussion of this subject which will give us the desired perfection.

By the mechanical treatment of fractures, I mean the use of such appliances as will give sufficient support to

* Dr. Holt was a distinguished Surgeon in the Russian army during the Crimean war, and subsequently in the Confederate service. He informs us that since writing this article he has used the method here recommended in several other cases with complete success.—Ed.

the fractured limb, while the healing process is going on, and prevent undue deformity. For the proper performance of our duty, then, as Nature's Assistants, there are two indications of prime importance to be met.

First. The reduction of the fracture, or, in other words, the placing the fractured ends of the bone in apposition, or in the event of comminution with loss of bone, the placing them in their proper direction.

Second. The fixing them in a state of coaptation or holding them in their normal direction until a callus be formed and become sufficiently strong to permit us to dispense with artificial support to the limb.

But as nature is sometimes very slow in doing her work of repair, and as tedious months of suffering must be looked for, especially in cases of compound comminuted fractures, there are two other indications of great importance, and absolutely requisite for the perfection of treatment. These are, so to say, almost antagonistic to the second indication, and are—

First. The comfort of the patient while confined to his bed, admitting of change of position, thereby preventing bed-sores and other discomforts of a long-continued position on the back; and,

Second. The frequent inspection of the diseased limb, enabling us to cleanse it, make the necessary topical applications, open abscesses, remove spiculæ, and in fact to meet any emergency which may arise in the progress of the case.

We thus have four indications, which may be summed up as—

1st. Reduction.

2d. Securing the reduction.

3d. The comfort of our patient.

4th. The inspection of the limb.

The importance of meeting these indications with a suitable apparatus has been felt since the earliest ages, and the means proposed are as various as man's ingenuity. I will spare you a historical discussion of the subject, but must say that in this branch of our profession the skill of the nineteenth century can boast but little over the common sense of Hippocrates. In all cases, but more especially in military surgery, a very important part of the treatment consists in the proper removal of the patient from the place at which he receives his injury to his bed, as the result of the case may thereby be very materially influenced. Before removal is attempted, the limb should be firmly supported by splints and compresses, so that the fractured ends of the bone may not unduly lacerate the soft tissues. In an emergency, shingles, a fence-board, or even round sticks may be used.

While making preparations for the expected attack by the Federal army at Corinth, in the Spring of 1862, the the idea of making splints of bark was suggested to me by seeing the soldiers take the bark from the trees for the purpose of shelter. The best splints were procured from young poplars eight or ten inches in diameter, and being prepared by taking off the rough outer bark and drying it under press, it proved to be both light and strong, and with a natural curvature which easily encased the limb. Much also has been said of the bed, and very ingenious contrivances have been made, but the best one is that which will be perfectly horizontal, sufficiently hard to obviate inequalities, and not too hard for comfort. I have sometimes prepared the bed by cutting the mattress as high as the body, and after taking away one half its width, filling the vacuum by a series of bran bags, three or four inches in diameter, one on the other for the length of the entire limb. By this arrangement the bed-pan can be used with comparatively little discomfort, and by

taking away the bags in succession the whole limb may be inspected with but little motion, and unsupported for not more than the diameter of the bag. After having placed our patient upon as comfortable a bed as possible, we now begin the treatment proper, and must meet the first indication, the coaptation of the fractured ends of the bone or the placing them in their proper direction. Without fatiguing you with a recital of the many apparatus suggested for this purpose, they may be summarily classed into such as have the body the fixed point, or point of counter-extension, making extension upon the limb, and such as have the limb fixed or counter-extended, and the body as the point for extension. As a type of the first class I will mention Physick's modification of Desault's splint; and as types of the second, the inclined plane and Smith's anterior splint. Of these I greatly prefer the first mentioned, and think that any apparatus, based upon the principle of extension by the body, radically faulty. In meeting the second indication a most ingenious innovation was made by the Arabs, who instituted the use of plaster, by which the limb is encased in a perfect mould, thus retaining the parts in a state of immobility. I have seen the plaster apparatus used in one case, and I do not like it, from the fact that it is, when complete, a ponderous, unwieldy affair, the material not always at hand, and it presents no advantages over the immovable starch bandages. Immovable agglutinative apparatus were in use in the time of Hippocrates; they gave way to other methods, and were almost in disuse until revived by Larrey, who was an enthusiastic advocate of the immovable starch apparatus. His bandage, however, only meets the second and third indications, and is of itself, I think, very incomplete and inadmissible in compound fractures, though he vaunted it very highly in those cases. The method of Mayor, as

also the anterior splint of Smith, I think inefficient in meeting this as well as the first indication, for the body can not make sufficient extension to retain in coaptation the fractured bones, if the patient is allowed to enjoy the mobility which is claimed as the greatest advantage in those apparatus. To meet the third indication, the immovable starch apparatus of every kind certainly possess the greatest advantages, though the apparatus of Mayor and of Smith are much better than any system of movable splints. For the fourth indication, all movable apparatus are preferable to the immovable. Thus we see that no apparatus will meet all of the indications mentioned, though some one of the indications can be filled by any of them. Hence, in the treatment of a case, we must endeavor to blend the advantages possessed by each.

If called upon to treat a recent fracture of the thigh, I would apply Physick's apparatus, and keep up constant traction upon the fractured limb until the contractile power of the muscles should be overcome as much as possible, and the œdema disappears. When this stage (which may be termed the acute) has been passed, and the patient begins to suffer from the constant confinement to one position, I would recommend the application of the apparatus of which the one I now present for inspection is a very imperfect model. Though it may be applied immediately, and as the œdema disappears, it can be reduced in size by paring the edges. I have tried it in two cases of compound, and one of simple comminuted fracture, with gratifying success, and would like to see it further tested.

The first case was that of a Sardinian officer, wounded in Cardigan's famous charge at Balaklava, by which the femur was badly comminuted by a canister shot which entered about two inches above the external condyle of the femur, and, ranging upwards and inwards, lodged

under the skin of the perineum. I first saw him about a month after the reception of the wound, and found him upon a double inclined plane, of which he complained as being insupportable. I removed that, and for more convenience in inspecting and dressing, placed the limb upon the bran bags (spoken of before) and supported it with two long splints. Soon after this I was taken sick, and when I again saw him, six weeks later, I found him wearing Larrey's starch bandage, applied by Piragoff. His condition being exceedingly critical, with strong symptoms of pyemia, this apparatus was removed in two longitudinal halves, and some fragments of bone extracted. He was again placed upon the bran bags with some relief, but his incessant complaints of his back, upon which there was an immense bed-sore, urged me to devise something for his relief, and this apparatus is the result of my labor. It was suggested by an examination of the halves of the old apparatus of Larrey, which were still in his room. I immediately applied it with the paper modification, and as soon as it was completed and my patient placed upon his side, he overwhelmed me with expressions of gratitude for the relief he felt. Up to that time there was no evidence of bony union, and while applying my apparatus, I extended the limb powerfully with Physick's apparatus. He began to improve soon after using this apparatus, and in six months after the reception of his wound he could walk unaided and with but little shortening of the limb.

The second case was that of a young man who had his thigh fractured obliquely at its upper third by a minnie ball at the battle of Murfreesboro. In this case I first used Physick's apparatus, and about ten days from the reception of the wound I applied this. He convalesced very rapidly, and was going about on his crutches in a month after he was wounded. He left me in about two

months, with no shortening of the limb. A short time, however, after leaving me, he fell violently forward on the steps while making a leap with his crutches. The limb was unsupported at the time—no effort was made to arrest the overlapping of the fractured ends of the bones caused by the violent breaking up of the callus, and the result is some shortening.

The last case is the one upon whom was placed the splints before you. About the 25th of October, 1866, I was called to the country to see R. S., a colored man, aged about fifty-three, whom I found with a comminuted fracture of the upper third of the thigh, caused by a fall from a height of fifteen feet upon a log. Wishing to have him more constantly under my eyes, I had him brought to the city, and with the assistance of Dr. Gaston applied this apparatus. Before applying this he had worn Physick's apparatus for several days, and continued to wear it until this was completed. Nothing occurred to impede his convalescence, and, yielding to his entreaties to return home, he left me about the middle of December and before the callus was firm. Before leaving, an accurate measurement was taken of both limbs by Dr. Gaston, and there existed absolutely no shortening. Soon after leaving me he opened the apparatus, as you see, at the ankle, to relieve pressure; and hence deprived the apparatus of one of its greatest virtues. The result is about half an inch shortening, when there should have been none. But even as it is, I know of no apparatus which, under the circumstances, would have been attended with so good a result.

The manner in which I usually proceed to apply the apparatus is as follows: After preparing a sufficient number of strips of brown paper (the unglazed paper is the best) from one to one and a half inches wide, and long enough to pass round the limb, I cover them with

flour paste, or other agglutinative substance, on both sides, and place them upon a piece of cloth wide enough to support the strips and long enough to extend from the upper margin of the pelvis to a few inches below the heel. Commence at the upper extremity and place the first strips from the perineum to the upper margin of the ileum diagonally, to fit more snugly the pelvis, and let each strip cover two thirds of the preceding one, and thus continue as far below the heel as it is desired to cover the foot. Then recommence a second layer, and, if desired, a third, and when completed the three layers will make nine thicknesses of paper. Before applying, it is well to cover the layers of paper with strips of dry cloth, to protect the limb from the paste. When this part of the work is completed, the patient should be carefully raised and the whole placed accurately under him. Then apply the strips of cloth like the bandage of Skultetus, and after that the paper in the same manner, taking care to apply them with exactness, more especially about the foot and perineum.

In the next case I have, I shall place a small compress over the patella before applying the paper, as all of my patients have complained of pressure at that point. In my first case I had some difficulty in cutting the apparatus in two when dry, and since then I have removed it only when sufficiently dry to preserve its form. It should be divided into two longitudinal halves, as nearly equal as possible, and when removed their edges well adapted and held together by strips of paper pasted across their seams, and after covering this artificial limb well with a bandage, the cavity should be filled and strongly packed with bran or sand to prevent the edges turning in, or other warping, and to retain the form of the limb until it is perfectly dry. When dry the

bandage may be removed, and the process of layering conducted to any desired thickness. I would here suggest that in pasting the paper several aids be engaged, and the layering rapidly done, so that the strips of paper may not become too dry and stick together, thus rendering their application the more troublesome. The bandage should extend sufficiently high on the foot to support it and should embrace well the pelvis and perineum. The application of the paper should be made with the limb completely extended, and the traction on the limb should not be lessened until the paper becomes hard or is removed. Thus we have an apparatus light and strong, by no means difficult of application, and when completed, there is comparatively little trouble in treating the most protracted cases.

I claim that my apparatus meets more nearly all of the indications than any other, and by the aid of Physick's apparatus in completing it, it meets them all. Being applied while the limb is perfectly extended, and allowed to harden on the limb, grasping the foot firmly and fitting snugly in the perineum, it keeps the limb permanently extended, thereby meeting the second indication. Fitting as it does closely all of the inequalities of the surface, and holding fixed and extended the muscles and the ends of the bone in exact apposition or in their proper direction, the patient is enabled to change his position in bed, sit up, or even walk about, thereby filling the third indication. By cutting open the apparatus by a longitudinal section on its anterior and posterior aspects, two complete troughs are formed, either of which by confining the limb to it is sufficient to retain immovable the fractured ends of the bone. By removing in turn each half, the whole limb may be inspected, and thus is fully met the fourth indication. The apparatus may be securely held

together by three or four bandelets tied at equal distances apart.

In the case of a compound fracture, a fenestrum should be made for the escape of pus. I would suggest that when completed the apparatus might be painted or varnished, or covered with some other substance which would render it impervious to water, and admit of the application of water dressings. I have never used anything but flour paste, but I can imagine several substances which might be preferable, though none so easily obtained.

I have spoken of my apparatus as applied to fractures of the femur, but the principle may be applied to many other cases. I have applied it with great benefit in two cases of resection of the head and portion of the shaft of the humerus, and once made a very comfortable apparatus for a fracture of the bones of the forearm with newspapers. Besides its other advantages, I claim that the facility of obtaining the materials for its manufacture constitutes a very important advantage, for cloth may be substituted for paper. I have stated that this might be called a modification of an old apparatus, but I claim that the modification is important enough to give it individuality. I especially recommend its use in cases of compound fracture, though when used in simple fractures (especially where there is much contusion of the soft parts) it will contribute very much to our peace of mind by permitting us to examine occasionally the work that is going on under our appliance, and it will certainly add to the comfort of our patient to sponge the limb from time to time.

Persistent Eclampsia: Forced Delivery Accomplished by Bilateral Incision of the Cervix Uteri. Read before the Georgia Medical Association. By WM. P. HOLT, M.D., of Macon, Ga.

I was summoned at 6 p. m., on March 9th, 1867, to see Mrs. —, a *prima para*, aged nineteen, stout, robust, and very plethoric; was informed by her that she had "grinding" pains at regular intervals of fifteen or twenty minutes since 11 a. m., and that she was under the impression that she was not at full term. I made an examination, and found the os very high up, *undilated* and rigid. She stated that she had had an unusual *fulness* about her head for the past three weeks, that her limbs were swollen and that the pain in her arms was so great at night as to prevent her from sleeping, that about ten days since, while going down the steps she fell, but experienced no inconvenience from the fall, not even soreness.

The pains continue to increase in severity, and at 10 p. m. she had heavy bearing down pains, when I again made an examination and found the os in the *same position and condition.* Up to this time there was nothing unusual in her appearance. Expressing a desire to empty her bladder, I retired from the room, leaving her in charge of her husband and nurse, and was informed upon my return to her chamber that she had voided urine, and had sat up before the fire, warming her feet (which, notwithstanding the application of hot irons, continued cold), and that while up there was a wild expression about her eyes. I detected a slight twitching about the facial muscles and at once bled her sixteen or twenty ounces, and dispatched a messenger for my friend Dr. D. W. Hammond.

He arrived at 12 m., when she had a violent convulsion. Upon consultation we determined to apply mustard sinapisms to her head, and to try the effect of chloroform, the *free inhalation* of which seemed to modify, but not

arrest the convulsions. Examination revealed no change in the condition of the os; ordered the following:

℞.—Ol. Recini ℥ii.; Ol. Terebinthenæ ʒi.,

which she retained, though she had been *vomiting* occasionally all night. Dr. H. and myself both remained with her until 7 a. m., when I was summoned home, leaving her in his charge, and promising to return at 8½ o'clock, and to invite Dr. C. B. Nottingham to see her with us.

I returned at the specified time, and was informed by the Doctor that during my absence she had thirteen convulsions, and that each one was more terrific than its predecessor, that her face became livid, breathing stertorous, and in fact she was almost comatose. We determined to make an effort to *force* the finger through the os, and if possible rupture the membranes, which was accomplished after much difficulty, the contraction being so firm that it was almost impossible to move the finger.

At 9 a. m., Dr. Nottingham arrived, when the patient had another convulsion, which seemed as if it would terminate her existence. Upon examination (there being no change in the condition of the os) we determined to bleed her again, which I did *copiously*, and to wait until 12 m. for further developments, at which time Drs. H. and N. were to see her. After the loss of blood she was more quiet, although her breathing was heavy and labored. At 11 a. m. she became restless, tossing to and fro, requiring two or three attendants to keep her in bed. At 11:20 she had another convulsion, followed at short interval by another; a few minutes before 12 another, when the Doctors arrived, and determined that something must be done, and speedily; patient insensible, and os still *undilated;* agreed upon bilateral incision of cervix uteri; drew her to the edge of the bed, limbs drawn up and supported by Dr. N. and myself; Dr. Hammond

proceeded to divide with a probe-pointed bistory the undilated neck of os in a lateral direction on each side, cutting toward the right and left acetabulum, and then *forcibly* dilating with finger, introduced a hook, caught the foetus in the groin (being a breech presentation), drew it down, and in a few minutes delivered her of a dead female fœtus about seven months; patient still insensible, and circulation very feeble; placenta taken away entire, but uterus not contracting well, introduced the hand, removed a quantity of clots, and inserted a piece of ice; put her to bed, and ordered feet kept warm, head cool, and flaxseed mucilage kept constantly applied to her tongue, which was very much swollen from being bitten during convulsions, although efforts were made to prevent it by the introduction of a piece of wood and a spoon between her teeth; to meet at 5 p. m., during which time she had no more convulsions; condition comparatively comfortable; drew off urine with catheter.

March 11th, 8½ a. m. Again used catheter; patient seems rational, and answers questions by nod or shake of the head, tongue being too much swollen to articulate. 5 p. m. Ordered Ol. Recini ℥i.; Ol. Terebinthenæ ʒi.; used catheter; circulation 100; has a more natural appearance.

March 12th, 8½ a. m. Quiet this morning; bowels well acted on by the oil; did not use catheter, urine having been voided. 5 p. m. Restless; pulse 112; ordered anodyne draught.

March 13th, 8½ a. m. Did not sleep well; complains of pain in breast, which are distended and hard; ordered light diet, and to rub the breast with camphor soap liniment; mind entirely clear, but does not remember what has happened.

March 14th. Improving.

March 15th. Restless; ordered forty drops elixir opium.

March 16th and 17th. Doing well.

March 18th. Discharged.

Remarks.—The foregoing case has thus been minutely described, because to my mind it was an extraordinary and peculiarly interesting one, from the protracted and persistent, unyielding rigid os uteri, and from the novel but successful mode adopted for its relief. "Under the head of difficult labor, may properly be considered all cases where, from any cause, the delivery is retarded or rendered dangerous."

In this case the delivery was not only retarded but rendered imminently dangerous by the rigid and unyielding condition of the os uteri. The remedies, according to the best standard authors, are blood-letting, nauseants, the use of beladonna to the parts, and, above all, anæsthetics. Recently it has been suggested in slow dilatation of the os to divide to a limited extent a portion of the circular fibres, but I believe has not met with much favor from the profession, because it is considered dangerous and rendering the patient liable to rupture of the uterus. Opiates have been recommended when the labor is tedious, its advocates claiming that it quiets the contractions, thereby giving time for the circular fibres to dilate.

In the case under consideration the patient had been nauseated and vomited frequently, was bled *copiously*, and kept under the influence of chloroform for several hours, all of which had *no* influence in *dilating* the os uteri. The beladonna was not applied, because the writer has never seen any good effects from its use, and this opinion has been corroborated by the experience of his personal friends in the profession. A full opiate would have been given (as the patient was persuaded she was not full term)

had it not been for the hyperæmia of the brain which to my mind clearly contra-indicated its use.

Here, then, we have a case in which all the remedies have been employed that have been recommended, where the os does not dilate, all of which had *no* effect. The patient in imminent danger of dying from convulsions, and this bilateral incision of the cervix uteri was performed, which not only arrested the convulsions—having removed the cause—but terminated successfully, the patient having not one threatening symptom, but a speedy recovery.

Not having seen this particular operation reported, I desire to impress upon the profession the facility with which it can be performed when *necessary*, and that, too, with a reasonable hope of success.

Obligations of the Public to the Medical Profession. Read before the Georgia Medical Association. By R. C. Word, M.D., of Atlanta, Ga.

It is proposed in this paper to submit a few thoughts in relation to the want of appreciation by the people, of the peculiar difficulties which, to the medical profession, more than any other, have resulted from the late unfortunate war. The cause of medical science, not less than the interests of the practitioner, is jeopardized, and it would seem, therefore, a duty, both to the public and the profession, to speak out upon this subject.

In former times the principles of medical ethics, by which we were governed, were in some degree understood and acquiesced in by the more intelligent in the community. These principles recognized certain reciprocal obligations between the members of the medical profession and the public, and both were expected to perform their part; now, however, the rule appears to be changed

—the physician is expected to perform his obligations, while the people seem to regard themselves released from theirs.

We think it may be said, without boasting, that the *true men* of the medical profession in Georgia, and indeed throughout the whole South, are endeavoring to discharge their duties to science, and to the public, and are moving onward, despite the adverse circumstances of the times, in the same noble and benevolent spirit which has ever characterized medical men as a class.

The existence of the Medical Association of Georgia is, of itself, evidence of a spirit of investigation and progress amongst the members of the profession in the State. Its labors are devoted to the cause of science and to the public good. There are two medical journals in successful operation in Georgia, and several others in the South, and the work of collecting statistics and useful facts, from the records and experience of the war, is being diligently prosecuted.

On the other hand, what can we say of the conduct of the public toward the profession? Amid the turmoil and confusion of business pursuits, and the anxieties incident to the present disturbed state of the country, men seem to have lost sight of those great principles and rules of action which look to the general welfare. One of these rules which should govern the conduct of every good citizen, is the furtherance of science, and the advocacy of truth.

The great progress of medical science in the last half century, and the discoveries resulting therefrom, have proven of incalculable benefit to mankind. Take the single article of chloroform, and reflect upon the relief it afforded to the thousands of our suffering soldiers during the late horrible war, not to mention the suffering it has prevented in private practice, and who can place an esti-

mate upon its value? In the treatment of disease, in surgery, in chemistry, in public hygiene, and, in fact, in every department of medical science, the public is reaping the benefits of a rapid and unprecedented advancement.

Is it the desire of the people that this work of progress and improvement shall continue? If so, they should not neglect the *true men* of the profession. The sober, the educated, and the conscientious members of the profession should be sustained; for to them the country looks for the promotion of medical science, and they are the true conservators of the public health. Upon them alone can the people safely depend in cases of trying and critical emergency, and their presence furnishes a safeguard and protection to life and to health which should not be lightly estimated.

How often does it happen, especially in this day of accidents by steam and machinery, that cases occur in which the highest skill and science alone can avail to save life—cases wherein impudence and humbuggery can not cloak the ignorance and inefficiency of the imposter, and wherein the life of the sufferer absolutely depends upon the prompt attendance of the skillful and educated physician? The presence of the intelligent medical man in a community is, then, a matter of serious importance, for critical cases, of the kind alluded to, may happen at any moment, and, indeed, are far more frequent than is supposed, for they are not always palpable to the non-professional observer, even in surgical cases, much less in ordinary diseases. It is in the latter class of cases that the quack so well succeeds in getting the people who, while acknowledging the necessity of calling upon the man of science in these rare and critical cases, nevertheless too often bestow upon the quack the more lucrative, because the more frequent, emoluments of the

daily practice. Such a course on the part of the people is both wrong in principle and suicidal in policy; and it is well that the public be advised of the fact that it is driving from the profession those who are morally and intellectually best qualified to practice its humane and responsible duties.

But patronage to quackery over legitimate medicine is not the only evil of which we complain: there is yet another which is forcing many worthy men from the practice of medicine into other channels. It is that *medical bills are not paid*, and that medical men are not allowed by public sentiment to present their bills for collection, and require prompt payment thereof, as is done in other departments. Custom has invested the medical profession with a dignity which places it in a different position from other avocations in the matter of collecting debts. If the physician drives his patrons he lowers himself in their estimation, and not unfrequently gives offence. Why is this, and why is it considered a lowering of professional dignity for the physician to demand his pay? The cash system now holds in every other department. How is the physician to meet the cash demands that are daily made upon him when he is required to credit indefinitely any and everybody?

When the medical man applies for credit at the store, or the provision market, he finds that deference to professional dignity does not avail to relieve him from the demands of the cash system, and the merchant plainly tells him, "Sir, my rule is cash; we let no goods go without the money." This, it will be said, is right. Grant it. But reverse the case, and let this identical merchant send for the physician, who replies to him, "Sir, my rule is cash; I visit no case without the money." Would not the merchant be highly offended, and would he not

ever afterwards regard this physician as an exacting and unfeeling man, and unworthy of patronage.

It is a fact well known, and one to which the public mind should be directed, that hundreds of the best men in the profession are being literally starved out by this unjust and ungrateful discrimination. We say ungrateful, because the conscientious medical man has claims upon the community far beyond the amount due by the few who are willing or able to compensate him for his services. He is a public benefactor in the highest sense of the word. The people are strangely insensible to the fact, that the physician does an amount of gratuitous labor far surpassing that of all other callings combined; and as the burden of caring for the poor should rest equally upon all classes, the undue proportion which the physician sustains should be placed to his credit as against the community. The argument that these charities are incident to the profession he has chosen, and must, therefore, be borne, is too illiberal and unjust to merit a reply. Yet it is evident that such is the light in which their services are viewed, and that little or no merit is attached to their performance. To such an extent, indeed, has this feeling grown upon the popular mind, that the physician seems to be regarded as a mere philanthropist, whose duty and pleasure it is to act for the public, and who requires, and is entitled, to no compensation.

In Germany, and in other European countries, the Government provides for the medical treatment of the poor; but here the Legislature not only refuses to compensate the practitioner, but hightens the infliction by imposing upon him a heavy specific tax.

In 1860 the Medical Association of Georgia, in a memorial to the Legislature in reference to the injustice of the specific professional tax, thus alludes to the gratuitous services of the physician:

At all seasons, and in all kinds of weather, in the dark hours of night when others are asleep, the medical man passes from one scene of distress to another, bestowing his labor, impairing his health, and dispensing drugs to the indigent sick. To this course he is impelled by two powerful forces; the first and greatest is the demand of humanity, which, to a conscientious man, leaves often no alternative by which to escape the call. The second is the force of public sentiment, which will not tolerate in the physician that freedom of action which it allows to others. The merchant may refuse credit to whom he chooses; the druggist may decline to sell to an insolent customer, and it is well; but the physician who exercises this liberty brings upon himself the severest censure, and consequent injury to his character and business.

To the many cases of casualty and death which occur in this fast age, a large proportion of which is amongst the poorer classes, the physician stands a ready servant, subject to every beck and call, and is expected and required to have in readiness all the appliances and material, at whatever cost, adapted to every emergency. By his promptness, skill, and benevolent agency, he relieves large numbers, and oftentimes rescues them from impending death. When under analogous circumstances a party is snatched from a burning dwelling or a watery grave, the individual who performs the deed is esteemed a hero. When a mariner rushes to the rescue of a distressed crew, he gains for himself laurels of praise and medals of honor. Not so the physician. He is regarded as having performed a mere commonplace duty, and scarcely meets with a passing commendation; and such is the tyranny of custom and law, that if he refuses to respond to every call, he encounters the indignant frown of the community, and failing, from the want of facilities or other cause, to adopt the most scientific treatment, he becomes liable to prosecution and heavy damages.

When the cholera or other destructive malady rages as an epidemic in a community, the physician remains at his post facing danger and death for the public. In the medico-legal investigations, at coroner's inquests, and in *post mortem* inspections, the services of the physician are required, and yet the State has made no adequate provision for his compensation.

If in the days of peace and prosperity these burdens bore unequally and hard upon the medical man, what are they now, when the proportion of poor to be treated has

increased ten fold, when the proceeds of the negro practice has been cut off, and when increased specific taxes by the State, the County, and the Federal authorities are extorted from the practitioner?

Medical men, as a class, are proverbially benevolent and kind, and have ever borne with patience the heavy responsibilities of the practice and the exactions of the public; but the time has arrived when in consequence of their own destitution, and the impoverished condition of the masses, they feel constrained to protest against the vast inequality of the burdens they are called upon to bear.

Other facts could be adduced in proof of the positions assumed, and to show that the physician is a public benefactor, and is entitled to the gratitude and support, instead of the censure and neglect, of the public. But we conclude by recapitulating the points we have endeavored to establish.

1st. There are reciprocal obligations between the public and the members of the medical profession.

2d. The medical men are nobly discharging their duties, but the people are unmindful of their obligations, which require them, both as a matter of principle and of policy, to support the true men of the profession.

3d. Medical men are not paid: they are forced to adopt the old credit system, which is but little better than starvation, as the result of which many good men are leaving the profession.

4th. Medical men are benefactors to the public, for which neither the Legislature nor the masses of the people have any just appreciation.

A Case of Femoral Aneurism treated by Ligation. By De-Saussure Ford, M.D., Professor of Anatomy in the Medical College of Georgia.

In September, 1864, William, a negro, twenty-three years old, was wounded by a load of buck shot; a few minutes after, four or five of them were extracted from the posterior part of the left thigh, where they entered.

The patient made the following statement: there was free hemorrhage immediately after he was shot—the wounds, after suppurating for *three months*, finally healed —there was no tumor noticed until after the healing was completed, but, soon after, a small tumor was discovered in the inner part of the thigh. January last he came to this city for treatment. There was a large aneurismal tumor, five inches in diameter at the base, which occupied the lower angle of Scarpa's triangle. Treatment by compression was commenced, but the pain was so excessive the patient refused to submit to it, and returned to his home in Madison, Ga.

He presented himself again in February, the tumor very much more enlarged. After recovery from an attack of tonsillitis, he consented to submit to an operation.

The wound having been inflicted from the rear, there was some doubt whether the femoral or profunda artery was wounded. After consultation with other members of the Faculty of the Medical College, I determined to cut down to the femoral artery in Scarpa's triangle, and if pressure on the vessel below the profunda arrested the pulsations on the tumor, to ligate; accordingly, on February 13th, at the Freedman's Bureau Hospital, assisted by members of the Faculty, and in the presence of the students of the Medical College, chloroform having been administered, I made the usual incision for reaching the vessel in the upper part of Scarpa's triangle, and succeeded in ligating

the femoral artery about an inch below the profunda, which was given off rather higher than usual, a fortunate circumstance for the favorable result. After the wound was dressed, the limb was enveloped in a flannel bandage, from the toes to the hip, and the temperature carefully noted, with the thermometer, for thirty-six hours. The anastomatic circulation was so rapidly established that there was little diminution in the temperature of the limb.

Four days after the operation, William was attacked by variola, and was removed to the Small Pox Hospital. During the progress of this disease, which was of a mild form, the ligature came away March 1st, fifteen days after the operation. The tumor had decreased so perceptibly, with every indication of its early absorption, and the wound made by the operation so nearly healed, he was allowed to return to his home March 21st.

William dates a letter May 13th, three months after the ligation, in which he says: "The place you operated on my leg is going down very fast; it is not more than half the size when I left Augusta. Dr. Knight has examined it twice since I came home, and says it is getting along very well."

The Restraining Nerves, a Contribution to Nervous Pathology. By Drs. A. EULENBURG and L. LANDOIS.

Although until recently only two great groups of nerves were recognized, the sensory and motor, yet latterly a third group, the restraining nerves, has been added to the former. The elucidation of the diseases of these restraining nerves is the subject of the present paper.

Under restraining nerves are included all those that interrupt, anywhere or anyhow, irritation produced or movement originated elsewhere. Their function, therefore, consists in the staying of movement. These nerves, like all others, are liable to disorder, both in their active and in their conducting apparatus. Besides these central

ganglia and fibres, the restraining system possesses also special peripheral terminal organs, to which the restraining impulse excited in the centre or in the conductor is directed, and in which it is fulfilled. The terminal organs appear to be ganglia, standing in relation to the motor apparatus.

The nature of the disorders may be either to increase or diminish the proper function, as in the nervous system elsewhere.

The range of these nerves comprise four systems, in which the restraining action has at present been clearly shown by physiology. They are:

1. The restraining system of the heart movements (cardiac, or that of Weber and Budge).
2. The restraining system of the intestinal movements (respiratory, or Rosenthal's).
3. The restraining system of the intestinal movements (peristaltic, or Pflüger's).
4. The restraining system of the reflex movements (reflex, or Setschenow's).

Corresponding to these are restraint neuroses of the heart, the respiration, the peristaltic movements, and of reflex action.

1. The restraint of the heart.

Their physiological basis is the experiment of Weber and Budge, showing that irritation of one or both vagi diminishes or wholly arrests the heart's action.

In pathological conditions a restraint producing irritation of the vagus can be excited at many points, although a direct irritation is uncommon, and an indirect or reflex one much more frequent. The direct irritation is seldom excited in the trunk of the nerve, or in its centre in the medulla oblongata, more frequently in the peripheral ramifications of the cardiac branches in the heart itself. In central irritation the violent further symptoms that are produced, obscure the characteristic signs of vagus irritation. The same occurs also in case of the so-called heart poisons, such as the salts of gallic acid, cyanide of potassium, and others; and in complicated brain disorder, such as concussion and tubercular meningitis. Neuroses of the vagus from a part of the diseases comprised under the vague term, "angina pectoris."

The physiological type of a reflex heart neurosis is furnished by the well known crushing blow experiment of Goltz. In this the irritation proceeds from the sensory

nerves of the abdominal organs. Pathological cases that admit of the same explanation are sudden deaths from concussion of the abdomen, or from the passage of a catheter. To the same category belong many cases of angina pectoris due to irritation of abdominal organs, and attended by lowering of the heart's action, anguish, syncope, cold pale skin, and fallen countenance. So also do the effects of wounds of the intestine, many cases of (especially toxic) gastritis, of nervous gastralgia with lowering of the circulation, of stoppage or intussusception of the bowels with similar symptoms, of colic from biliary or renal calculi, and of peritonitis. The slow pulse of lead colic also depends upon vagus irritation. In all such cases death ultimately depends upon paralysis of the abdominal vascular system, as Goltz, in his blow experiment, has clearly proved. Mention should further be made of certain forms of nervous shock to the heart, with diminution of its functional activity from some abnormal irritation of the genitals, as onanism and hysteria.

2. The restraint neuroses of the respiration.

The physiological facts that underlie these disorders are not so free from doubt as those that relate to the heart; but they are, nevertheless, certain enough. They rest upon the experiments of Rosenthal, which teach that slight irritation of the superior laryngeal nerve diminishes the frequency of the inspirations; that stronger irritation entirely stops them, with relaxed diaphragm and closure of the rima glottidis; and that the strongest irritation produces contraction of the expiratory muscles. In this way cough is occasioned, and, in the higher degrees of irritation, spasmodic cough.

Rosenthal considers the superior laryngeal to be a restraining nerve for the inspiratory movements of the diaphragm. Its excitation is not centrifugal, like that of others, but centripetal; and its restraining centre is certainly not, like theirs, in the peripheral organ, but in the medulla oblongata, so that an analogous direction of action is maintained.

Pathological conditions dependent upon restraint neuroses of the laryngeal nerve are numerous. Prominent among them are spasmodic coughs, both the hysterical (a pure neurosis) and whooping-cough, which the authors hold to be an infectious neurosis. Again, there are the attacks of cough brought on by foreign bodies and by material changes in the air-passages.

3. The restraint neuroses of the intestinal canal.

These have their physiological analogues in the stoppage of the peristaltic movement, and the relaxed state of the intestinal walls from irritation of the splanchnic nerves, as first observed by Pflüger, and since confirmed by others, between the muscular layers of the intestine, and that supplies the intestine with motor fibres. The characteristic of neuroses of the splanchnic nerves is the diminution or arrest of peristaltic action, producing retarded evacuation or complete stoppage of the bowel. These symptoms, however, correspond to those of paralysis of the motor nerves. It is, therefore, difficult in concrete cases, to decide which of the two cases is in operation. Very often there is a combination of both.

An example of irritation of the splanchnic nerves is furnished by the typical symptoms of lead colic, which are pain and obstinate constipation. The first may be very well attributed, in part, at least, to irritation of the splanchnic nerves, since they contain sensory fibres. This irritation may itself strengthen the restraining influence by reflex excitation. The active character and the source in irritation of the costiveness are shown by the familiar therapeutic action of the anti-spasmodics. It would certainly have the same character if caused, as some assume, by spasm of the intestinal muscles; but in such case it could only be reflex, and excited through the attacks of colic, and it would probably only occur periodically, and not occasion constipation of so obstinate a kind.

Besides the attacks of pain, and the relief afforded by anti-spasmodics, the presence of irritation of the splanchnic nerves is further denoted by a similar action upon other restraining nerves, especially the vagus; from which, in half the cases of lead colic, we find marked retardation of the pulse. The distention of the abdomen, again, indicates paralysis of the intestine. The reputed spasmodic contractions are probably only consequences of the pains, and are partly only apparent, and only affect the large intestine, upon which the splanchnic nerves appear to have no restraining influence. They may also be produced secondarily, through the irritation of the mechanically-distended bowel, as we see in cases of internal obstruction.

It is probable that the psychical influences that modify the intestinal movements (as in hysteric meteorismus) follow the track of the splanchnic nerves, although their

centripetal course, beyond the thoracic sympathetic ganglia to the cerebro-spinal centre, is not certainly known.

4. The restraint neuroses of reflex action.

The restraining action of the will upon reflex movements, and their promotion by decapitation, have long been known. Setschenow was, however, the first to determine experimentally the reflex restraining centre in the brain of a frog, in the corpora quadrigemina, and optic lobe. An analogous office is, in the highest degree, probable in mankind. The diseases of this restraining apparatus may serve to explain many spasmodic conditions—such as epilepsy, chorea, tetanus, and paralysis agitans. According to Malkiewicz, we may consider the spasms produced by poisoning with strychnia, alcohol, and opium, to be results of paralysis of the reflex restraining centre, upon which all these substances exert a decidedly paralysing influence.—*Wien. Med. Wochenschr.*, 1866; *Schmidt's Jahrbücher*, 1866.

The Results Attending the Removal of the First Growth of Cancer. By Mr. JOHN BIRKETT, Surgeon to Guy's Hospital.

What advantage does a patient obtain in submitting to the removal of a cancerous tumor? The answer which Mr. Birkett gives to this question is too full of interest to be curtailed. He writes:

"The facts upon which to base a reply to this inquiry are derived from the investigation of a hundred and fifty cases carefully recorded by myself; and although I have not always performed the operation, I have seen the patient and examined the growth after its removal. A majority of the patients are dead; for it should be borne in mind that this collection of cases was commenced eighteen years since, and that not a little difficulty arises in being able to follow out patients who survive several years.

"Also, it must be stated, that I have not made any selection of the cases with the view to uphold or support any particular statement. The sufferers who succumbed to the disease were placed in the order in which death occurred, and therefore some allowance should be made in those cases in which death ensued very rapidly after

the development of the disease appearing on the tables in greater numbers than those which survived the same thing many years.

"The above consideration, as well as others, render what are termed statistical tables, and deductions therefrom by means of averages, most fallacious guides to treatment.

"Table A is arranged to show the length of time during which one hundred and fifty patients were free from any indications of the local recurrence of the disease after the removal of the first growth.

A.—*Table showing the length of time during which a hundred and fifty patients were Free from Indications of the Local Recurrence of the Disease after Operation.*

	Cases.
Before the expiration of the first year	87
Between expiration of first year and close of second	15
Between second and third	7
Between third and fourth	7
Between fifth and sixth	5
Between sixth and seventh	2
Between seventh and eighth	1
Between eighth and ninth	3
Between ninth and tenth	1
Between tenth and eleventh	3
Between fourteenth and fifteenth	1
Between fifteenth and sixteenth	1
Sixteen years	2
Patients died free from local disease in parts first affected (see table)	15
	150

"Before the expiration of the first year, eighty-seven patients showed signs of a new development of the growth, either in the portion of the mammary gland not removed, the integuments in the neighborhood of the cicatrix, in that structure itself, or in the axillary lymphatic glands.

"After the expiration of the first year, and before the conclusion of the second, fifteen patients showed that a cancerous growth was again developed in one or other of the regions above mentioned.

"Now, this large proportion of the cases in which recurrence occurred, might be taken as a significant fact to demonstrate that the cases submitted to operations were badly selected; that, indeed, an operation was scarcely justifiable. But, in many of the cases, the operation was undertaken in the hope of removing a source of great

local pain and mental distress; of alleviating the misery and to abate the annoyance attending an ulcerated and sloughing surface, and at the earnest solicitation of the sufferer.

"In some, I confess, little, if any, advantages were gained. In others, although life was not prolonged by many months, the existence of the individual was rendered more tolerable, since the attendant circumstances before described were sometimes absent. Life was decidedly prolonged in a few cases, in which it was rapidly ebbing in consequence of repeated hemorrhages and deeply sloughing masses.

"Further, we may be allowed to suggest that many of the cases in this category might have been operated upon at a much earlier period after the discovery of the first growth, and with every probability of a happier result. But, in hospital cases, and a large majority were of that class, it too often happens that patients apply to such institutions as a last resource only.

"We may now turn to a somewhat brighter picture. To be free from such a disease as cancer for periods of time extending between three and sixteen years, is a fact surely sufficient to justify almost any means to accomplish such a desirable end. The risk to life attending the operation is not great, and now much of the horror of such a proceeding is mitigated by the employment of anæsthetics.

"In the wards of a hospital, even where the chances against the recovery of the patient are greater than in private practice, I calculate the death-rate at only seven per cent. During the last seventeen years, two hundred patients have been operated upon by my colleagues and myself in Guy's Hospital. Either the whole or a portion of the breast-gland was removed on account of a carcinomatous growth. All of these recovered from the effects of the operation, with the exception of fourteen, who survived it between three and thirty-six days only. It must be admitted that the operation was more or less the exciting cause of the disease which terminated life. These fatal diseases were erysipelas, followed by bronchitis; inflammation of the pleura, terminating in effusion; pyæmia; hæmoptysis; and vomiting; in fact, the too common causes of fatal complications after operations upon the poorer classes, inhabitants of large cities.

"But in private cases the mortality is so trifling that, admitting the risk to which every person submits who undergoes any operation, I am inclined to calculate it at not more than three or four per cent. I have lost only one patient, of forty-one cases operated upon for cancer.

"To proceed with the remaining cases. Of the patients, thirty-three in number, who survived the operation without any local recurrence of the cancer for periods varying between two and sixteen years, assuredly many of them must have died of the complaint within those periods; and all of them would certainly have been compelled to endure the mental anguish, if not the local suffering, accompanying the existence of this terrible malady, assuming that they had survived equal periods.

"Lastly, fifteen of the patients died without showing external signs of recurrence of cancer in the region first affected.

B.—*Cases in which the Cancer did not Reappear in the part first affected with that growth.*

Cases	Survived Operation	Cause of Death	Condition of local disease at operation
1	6 months	Hepatic disease	Integuments infiltrated
2	10 months	Thoracic disease	In same condition
3	11 months	Hepatic disease	As above
4	13 months	Carcinoma in calvaria	Mammary gland only infiltrated
5	15 months	Disease of ovary	As above
6	2 years	Cerebral disease	Integuments infiltrated
7	2 yrs. 2 m.	Hepatic disease	Integuments infiltrated and ulcerated
8	3 years	Thoracic disease	Mammary gland infiltrated only
9	4 yrs. 3 m.	Cerebral disease	Same as above
10	6 years	Thoracic disease	Integuments infiltrated
11	6 years	Cerebral disease	Integuments infiltrated and ulcerated
12	6 yrs. 6 m.	Exhaustion	Mammary gland infiltrated
13	6 yrs. 8 m.	Thoracic disease	Integuments infiltrated
14	10 yrs. 6 m.	Cachexia	Integuments ulcerated
15	11 years	Cachexia	Mammary gland infiltrated

"The Table B shows the length of time each individual survived the operation. This was between six months, the shortest time, and eleven years, the longest. In another column is stated the cause of death in each case, which was the development of cancerous growths in the viscera of either the cranium, the thorax, or abdomen, as determined by well-marked indications during life or by *post-mortem* examinations.

"I have introduced, in the same table, as brief a description as possible of the condition of the local disease at the time of the operation; and it should be noted that it had made considerable progress in some of them. The

integuments were infiltrated with cancer; in some, ulceration of the surface existed. Under these conditions, we are justified in assuming that some of the patients would speedily have fallen victims to the ravages of the complaint, and that all must have endured more or less of the suffering accompanying its progressive stages.

"By the removal of the growth, these fifteen patients were exempt from the misery inseparable from the activity of the local disease.

"Let us next inquire if the life of individuals afflicted with cancer of the breast is prolonged by the removal of the part first involved by the disease.

C.—*Table to show the number of years a hundred and fifty patients survived the Discovery of the Disease after the Removal of the First Growth.*

Under 1 year	8	Above 10 years	2
Above 1 year	24	Above 11 years	2
Above 2 years	38	Above 12 years	1
Above 3 years	17	Above 13 years	1
Above 4 years	21	Above 14 years	2
Above 5 years	7	Above 15 years	1
Above 6 years	5	About 23 years	1
Above 7 years	10	About 29 years	1
Above 8 years	4	About 32 years	1
Above 9 years	4		

"I have arranged Table C to show the number of years one hundred and fifty patients survived the discovery of the disease after the removal of the first growth. Rather more than one half died before the expiration of the fourth year, or in the ratio of fifty-eight per cent.; the majority dying before the completion of the third year.

"Thirty-three died before the expiration of the seventh year, or in the ratio of twenty-two per cent.

"Eighteen died before the conclusion of the tenth year, or in the ratio of twelve per cent.

"Twelve survived about ten years, or in the ratio of eight per cent. One person lived about thirty years after the discovery of the disease.

"In order to form some comparison between cases subjected to the above treatment, and those in which the disease was allowed to pursue its natural course, with the exception of using local palliatives and constitutional measures, I calculated the average duration of life of a hundred patients.

"Fourteen of these patients died within the first year after the observation of the disease; three survived its

discovery above ten years, two of them having lingered under its slow progress about twenty-six years.

"The average duration of life I believe to be about three and a half years.

"Of the cases, then, which have fallen under my observation, it is quite certain that the longest survivors have been those from whom the first growth was removed.

"Whether the duration of life was really essentially due to the removal of the first growth, I would not venture to assert dogmatically; for there are many collateral circumstances which require to be taken into consideration, for which the time is insufficient upon the present occasion.

"In conclusion, I trust that I have demonstrated to my sceptical professional brethren that a certain proportion of cancer patients can receive benefit by submitting to the removal of the first growth of the disease; and that the benefit derived from the operation is twofold—viz.: 1st, prolongation of life; 2d, exemption from disease for a considerable period of time in many instances."—*British Medical Journal.*

On the Employment of Galvanism on Promoting the Cicatrization of Sluggish Sores. By Mr. NUNN, Surgeon to the Middlesex Hospital.

Mr. Nunn records the following cases. In treating ulcerations he finds it indifferent whether an induced or continuous current be used. He has often used Pulvermacher's galvanic chain with advantage in obstinate sinuses.

Case 1.—W. F., aged twenty-three, had benign fungus of the testis, the sequence of strumous abscess. There was a circular perforation of the scrotum on the left side as large as a florin, and it had existed during twelve months. The fungus was about the size of a walnut; there was a free discharge from it of yellowish glairy purulent fluid.

October 12th. Galvanism of weak intensity (from a single cell), to be applied for five minutes every morning. The effect of the galvanism was most remarkable; the fungus receded, and the edges of the perforation contracted over it, after a few days.

27th. A slightly stimulating lotion of nitrate of silver was ordered (half a grain in the ounce of water).

30th. The solid nitrate of silver was brushed round inside the sore, which had now nearly closed; and nitric acid and decoction of bark were ordered to be taken three times daily.

November 6th. The patient was discharged, the sore being quite healed.

Case 2.—H. D., aged five years, was admitted with an unhealed sinus, probably caused by caries of one of the cuneiform bones. The swelling was chiefly on the inner side of the foot, in front of the instep. The tarsal end of the metatarsal bone of the great toe was enlarged. There was the history of a sprain; and the child's parent believed the disease of the foot to be due to the sprain. An incision had been previously made in the part, and some unhealthy bone scooped away by another surgeon. The child had a scrofulous appearance, and its belly was tumid. Mr. Nunn ordered nitric ether in half-drachm doses, with syrup, three times a day—a medicine which he believes to exert the most useful influence in promoting the nutrition of cachectic children, and to have the power of diminishing that distention of the abdomen so characteristic of deficient nutrition from sluggishness of the mesenteric glandular system. Iodide of potassium ointment was also prescribed to be rubbed into the belly. These measures were carried out from January 27th to February 11th, without much change in the appearance of the sinus, when galvanism was ordered to be applied for five minutes three times a week. The effect of the galvanism was at first to diminish the angry redness of the part, and also the amount of discharge from the sinus. By the end of the month the sinus had scabbed over, and the patient was discharged on the 7th of April, convalescent.

Case 3.—Jane D., aged twenty-two, admitted December 12th with angular curvature of the spine. She was healthy up to the age of fourteen years, when she began to suffer from rheumatic pains "all over her." There was at the date of admission an opening in the upper third of the right thigh, about the apex of Scarpa's triangle. Four years since there was some swelling and stiffness of the thigh; two years since, at the seat of the opening, a swelling as large as an egg. The spine projected in the lumbar region; there was some tenderness on either side

of the spinous processes; and occasionally at night, and at a change of weather, pain in the part was severe.

Iodide of potassium, in three-grain doses, three times a day, was ordered; and directions were given to double the dose in the event of increase of pain at night. Iodine paint to the back.

On the 26th, galvanism was directed to be applied twice a week, the current being passed from the thigh to the spine. This was continued until February 13th, when the patient was discharged, much improved. The sinus in thigh had nearly closed.

Case 4.—Agnes D., aged four, admitted November 14th, having a superficial strumous ulcer, with somewhat excavated edges, surrounded by small pustular elevations, on the dorsum of the left hand. There were similar sores on the foot and face. Iodide of potassium in one-grain doses, twice a day, with cod-liver oil, were prescribed.

On the 17th, galvanism for five minutes was ordered to the foot, twice a week; on the 28th, to the hand and face also. This was followed almost immediately by a change to a healthy action in the sores. The patient was discharged, convalescent, January 9th.—*The Lancet*, *July*, 1866.

Experimental Investigations into the Action of the Bromide of Potassium. By Dr. ROBERTS BARTHOLOW.

The author's investigations were conducted in three directions: 1st, The chemical properties; 2d, The physiological effects; and 3d, The therapeutical uses of the salt.

The physiological effects of the salt when taken into the stomach, Dr. B. sums up as follows:

"1. It proves irritant in large doses to the mucous membrane of the stomach.

"2. It is rapidly absorbed into the blood, and may be detected soon after in the urine.

"3. It acts upon the nervous centres, producing sedation, sleep, reduces the action of the heart and arteries, lowers the temperature, and diminishes the retrograde metamorphosis of tissue."

The prolonged administration of the bromide of potassium produces, according to Dr. B., the following effects:

"1st. It diminishes and ultimately entirely neutralizes the sexual appetite.

"2d. It produces weakness of the muscular system.

"3d. It is irritant to the stomach if given in considerable doses; and

"4th. It interferes with the secondary assimilation, lessening the retrograde metamorphosis of tissue."

In regard to its therapeutical uses, Dr. Bartholow extols it as a *disinfectant* and *deodorizer*, as an *escharotic* in sloughing and gangrenous ulcer, phagedenic chancres, hospital gangrene, epithelioma, etc.

"The actions of the bromide of potassium, physiologically considered," Dr. Bartholow states, "consists in a sedative or contra-stimulant effect upon the nervous centres, producing as secondary phenomena, sedation of the heart, anæmia of the brain, anaphrodisiac effects, and diminution of the retrograde metamorphosis of tissue. It has come into use in various functional and organic nervous disorders, and in certain sexual diseases where a calmative and sedative influence is desired."

This salt Dr. Bartholow considers to be indicated as a hypnotic in states of nervous excitement without congestion of the nervous centres; in hysterical insomnia; in delirium tremens; in the insomnia of excitable business men, or, in general terms, in those forms of insomnia dependent upon excitation without increased blood supply. He has found it especially useful in irritable bladder, and the chordee of gleet.

From a careful survey of all the facts, Dr. Bartholow gives the following as the *methodus medendi* of the salt in question:

"1st. The bromide of potassium acts by absorption into the blood.

"2d. Its effects are expended upon the nervous centres, or the cerebro-spinal axis.

"3d. Sedation of the heart and circulation, and the various local sedative effects are secondary results of the impression made upon the nervous centres.

"4th. Its physiological effects are not very decided, and are easily modified by any local disturbance.

"5th. Its therapeutical action is still more decidedly influenced by local morbid processes.

"6th. It is indicated where a sedative to the nervous system is required—in insomnia; in great reflex excitability; nervous and spasmodic affections of the larynx and bronchi, sexual excitement, and in an irritable state of the sexual organs.

"7th. It will be effectual in the foregoing conditions, in proportion to the degree in which structural lesions are absent, or, in other words, in proportion to the degree in which these morbid states are functional rather than organic."

The bromide, Dr. Bartholow asserts, possesses none of the peculiar alterant properties of the iodide. Whilst this fact is true, it is undoubtedly the case that the bromide relieves the congestion of certain organs, diminishes their bulk, or, as it may be styled, produces resolution of an engorgement. Such action, apparently alterative or resolvent, is not really so. It has been exhibited mainly in certain states of the uterus and ovaries—states of hyperæmia dependant upon sexual excitement, or upon the monthly nisus. The apparent resolvent power is, in this case, due to the sedative impression of the remedy upon the sexual organs and upon the vaso-motor nerves. —*Cincinnati Lancet and Observer; American Journal of the Medical Sciences, January*, 1866.

How to Examine and Syringe the External Ear. By A. D. Williams, Cincinnati.

The reason why we can not see down to the bottom of the ear, is because we "always stand in our own light." When our eyes are placed in a proper position for looking in the ear, our heads cut off or prevent the entrance of light from without. Hence, the first thing to be done in order that we may examine the external meatus, is to illuminate it. The principle by which we light it up is precisely the same as in the illumination of the eye, that we may see its fundus. As to the source of light, we may use either the direct sun-light, common gas-light, coal oil lamp, or the light from a small window that looks out, not against another building, but into free space, toward the clouds or sky. Such a light affords perhaps the best light, but either of the other three sources may be employed very well. The direct sun-light makes the ear feel quite warm when thus concentrated upon it, and if used for a considerable time, might even burn it. The gas or lamp-light makes the membrana tympani look *redder* than natural, and might even lead to deception from this fact.

Before whatever source of light we choose to use, or have at our command, we place the patient with the ear to be examined turned away from it. His head is inclined a little forward and toward the light. A speculum (Gruber's or Toynbee's) is introduced *gently* (in all manipulations with the ear, *gentleness* is the *first law*) down as far as it will go into the meatus without pain. The speculum corresponding exactly with that of the meatus. It is now held in position by the left hand. In the right hand the surgeon takes a mirror (three inches in diameter and six inches focus), made expressly for illuminating the ear, and throws the light through the speculum into the bottom of the aural canal. In the centre of the mirror is a little hole, similar to that in the ophthalmoscope. Placing his eye behind the mirror and over this small opening in the same, the operator looks through it, down to the bottom of the ear, just as we look into the eye with the ophthalmoscope. In this way the whole outer ear is thoroughly lighted up, and we are thus enabled to see and examine all its natural structures most minutely and most perfectly. If we wish we may magnify them simply by holding a convex glass, No. 3 or 4, before the speculum; but this is rarely necessary, even for the most perfect examination. It enables us to see and judge of things deep down a little better than without it.

The old method of examining the ear by letting the sun-light fall directly into the speculum was rather impracticable and quite unsatisfactory, for the simple reason that its natural structures could not always be distinctly seen, besides the sun-light was not at all times to be had.

The above described method of illumination by means of the mirror, first introduced and practiced by Dr. Troelch, of Wurtenburg, is very far superior to it in convenience and distinctness, and should be adopted by every one who, for any purpose, examines the ear. I will not just here describe in detail what is to be seen in the external meatus. I take it for granted that every one knows what is to be found there, and can easily distinguish what is pathological and what is natural.

I therefore pass to the second part of the subject—

HOW TO SYRINGE THE EAR.

The more common anything is the more it deserves to be noticed. This is my only apology for introducing such a common topic.

The meatus auditorius externus is the way or tube that leads down to the bottom of the external ear, that is, down to the membrana tympani, which is the partition wall between the outer and middle ears. Its general course is inward, a little downward and forward, but not in a straight line. There are several minor deviations from a straight line, but only one that deserves special mention in connection with syringing the ear. Practically considered, the anterior and posterior walls may be regarded as straight; the upper makes perhaps a *very* small gradual curve with the concavity looking downward. The lower wall makes a decided angle, a little beyond its middle, with the angular point projecting into the meatus from below, and corresponding, to some extent, with the general concavity of the upper wall. The direction of the inner portion of the lower wall is such that it makes, with the membrana tympani, quite a pocket at the bottom and lower portion of the meatus. In order that a stream of water may reach thoroughly the bottom of the ear, it is necessary first that the way that leads to it be straightened as far as possible. For this purpose take hold of the auriculum, or external portion of the ear, and draw it pretty firmly directly upward, and in this way the upper and lower wall are brought as nearly as possible into straight lines. Holding the ear in this position with the left hand, take the syringe in the right and inject the water *gently*, yet with a *little* force, into the ear, directing the point, which should be introduced a little into the external orifice of the meatus, inward, a little downward and forward in the general direction of the tube. Of course a cup must be pressed against the face, beneath the tragus, in order to catch the water as it escapes. It is recommended to have two cups, one to contain the clean water to be injected, and the other to catch it. The best syringe for the ear that I have ever seen, is what is known as the ear syringe, made of gutta percha, which is very light and very convenient, as well as durable. The syringing operation is to be continued till its object is attained, which is always *cleanliness.*

Better use simple warm water, without any soap, which is supposed to irritate considerably. It may be repeated as often as necessary for the attainment of the object in view. Some persons are not affected at all by syringing the ear, while others, who are in perfect health and who are anything else but *nervous*, faint from it.

It sometimes has a very peculiar effect upon the nervous system. In consequence of syringing the ear, stout, robust men reel and stagger like drunken men, and sometimes even fall flat upon the floor. If ladies should tumble over in this way, and from such a cause, inexperienced persons might be swift to call them *hysterical.* But the imputation would be false, for there are no hysterics about it. Then be careful how you make such charges against women, for men sometimes faint from the same cause.—*Cincinnati Lancet and Observer.*

Treatment of Opium Poisoning by a New Method. Read before the Norfolk District Medical Society, May 9, 1866, by A. LeB. Monroe, M.D., of Medway.

I was called in consultation to the wife of a clergyman, a lady about forty-four years of age, who was in a state of ultimate narcosis from laudanum. She was insensible upon her bed some three hours previous. Her family physician, Dr. H., was called, and immediately commenced a series of efforts to restore consciousness. A two-ounce vial, which had contained laudanum, was found in the room empty. After her recovery, she said that she procured two ounces of laudanum of a respectable apothecary, and about four o'clock p. m., she took nearly one half of it, and the remainder about half an hour afterward. Emetics of sulphate of zinc, ipecac, etc., had been given without effect. Powerful irritation of the surface, tickling of the fauces with a feather, etc., had been employed without any improvement; on the contrary, she was sinking, or had sunk, into a hopeless state. The pulse very slow, not over forty-five, and very weak, soft, and irregular. The respiration extremely infrequent and stertorous, with frothing at the mouth. The skin was cold and clammy; face pale and cadaverous; in fine, she was in a state of profound *coma*, which was apparently soon to end in death. The stomach pump had not been used. I applied it and drew off the contents of the stomach, which had a strong smell of laudanum. The operation of passing the tube and thoroughly washing out the stomach did not rouse her at all. No galvanic battery could be had, and if it could have been obtained, I should have applied it with little confidence in its power

to restore the patient. Dr. H. and her husband regarded the case as hopeless.

Years before I had read a book which gave some account of the tortures of the Spanish Inquisition, and among them all there was one which was represented as causing to the miserable victim an agony more intense and excruciating than any other method that could be contrived by those devils incarnate. It was the dropping of cold water, from the height of several feet, upon the naked pit of the stomach. I determined to see if the method used by inquisitors to torment and kill heretics would not save the life of the wife of a Calvinistic preacher. I proposed it to him and Dr. H. They assented, with little faith in its success.

We placed her upon her back on the floor, with her head elevated a little upon a folded sheet; slipped her clothes down below her waist, leaving the chest entirely naked. A pail of cold water and a pitcher were brought in. I placed myself in a chair, and raising the pitcher, filled with water, to the ceiling, eight or nine feet from the floor, I allowed the water to fall in a small stream upon the epigastrium. By the time the first pailful was exhausted, the breathing had evidently become a little more frequent and equable, and the stertor less. The second pailful was brought in, and soon, to my great joy, I could see that the deathly pallor of the face was being lighted up by the flow of the vital current from the heart. A blush, barely perceptible at first, gradually and steadily spread over the before pale and expressionless features, until it warmed into the full glow of life and health. (My feelings at this stage of the proceeding must have been, in some respects, not unlike those experienced by Pygmalion when his beloved statue of ivory began to live and breathe under his warm embrace.) By degrees other manifestations of returning life appeared. She began to make efforts to move away from the pouring stream, weak at first, but increasing in power, until she could turn partly over and interpose her hands to break the force of the stream. At length, after about three pailsful of water had been used, her struggles to escape from what was now evidently torture, was quite severe; and about this time, to our infinite satisfaction, she began to beg for quarter in long-drawn, drowsy syllables, increasing in energy and force, until they were uttered in a tone and manner which evinced a considerable degree of

passion, and even anger, at the strange and cruel treatment to which she was subjected. But even now she would fall asleep immediately if let alone. Having continued it as long as we thought it necessary, we desisted, and rubbed her dry with warm cloths. We then raised her up and walked her about the room, or rather about an adjoining room, which was dry, for an hour or more, resting at intervals. This was no easy task, for she was a full, well-developed woman, weighing one hundred and forty or one hundred and fifty pounds. She would beg piteously to be let alone and to lie down, and in spite of us she would often slip from our hands upon the floor. This forced exercise was continued until we deemed it unnecessary. She recovered without any permanent ill effect. It was the last attempt she made to destroy herself. She had been subject to periodical fits of insanity, in consequence of some catamenial derangement. She has had no return of insanity since then, and has lived a blessing to her family and society.

The *methodus medendi* in this case will not be difficult to understand, when we consider the anatomical and physiological relations of the parts immediately and mediately impressed by the cold stream of water. The pit of the stomach is one of the most sensitive portions of the body; it has a peculiar sensibility, which will not tolerate even a slight blow without suffering. The semi-lunar ganglion and great sympathetic, with its extensive and important connections, is powerfully excited, and the over-charged heart is roused to action by the direct and reflex nerve force. The effect is compounded of shock, to an extreme degree, and a permanent powerful excitation of the *vis nervosa*, causing more or less intense pain and distress, dependent on the length of time it is applied. The heart is compelled to contract and send forward its dark blood to be aërated in the lungs, and then to be distributed over the whole system, carrying life and activity to all its functions. Galvanism could do no more. Indeed, I do not believe it would do as much. Besides, a battery is not always to be had, while water is always at hand, and if applied as in this case, I believe it will be more effective in the cure of extreme cases of opium poisoning than anything else. Doubtless it would be as effectual in poisoning by other narcotics, and possibly in some cases of suspended animation.—*Boston Medical and Surg. Journal.*

A Brief Description of what appears to be Two Newly-Discovered Skin Diseases; one originating in the Cat and the other in the Dog. Both Cryptogamic and Contagious, and both capable of being transmitted from the Animal to the Human Body. By J. H. SALISBURY, M. D., Professor of Histology, Physiology, and Cell Pathology, in Charity Hospital Medical College, Cleveland, Ohio.

1. *Trichosis Felinis.*—This is a skin disease originating in the cat, and readily transmissible to the human subject. It resembles in appearance trichosis furfuraceæ, and, like it, has a cryptogamic cause. It is produced by a species of fungus that develops in the fermentation of cat's milk. It develops on kittens while nursing; first around the lips, nose, face, and eyes, and spreads to the head and body. It forms, with the epidermic cells, circular patches of thin rusty scurf on the face, nose, lips, and head. The hair soon sickens, curls up, dies, and crumbles away, and the eyes become sore and gradually close. Often the eyes become entirely shut. After nursing ceases, this growth gradually disappears. It often lasts, however, two or three months, and may be longer, after weaning.

This disease is contagious, and is readily transmissible to the human subject from the kitten, and from one person to another. It is contracted more readily by young children than by grown persons, yet it is readily contracted at all ages. On infants and young children it spreads rapidly, attacking all parts of the body alike. It spreads rather more rapidly on the hairy than on other parts of the body. The plants attack the hair follicles, in which they develop luxuriantly, sending off branches abundantly through the epidermic and cuticular layers. The spores and filaments of this mucedinous growth resemble those of *trichosis furfuraceæ.* They however develop much more rapidly on the human body, causing the disease to spread in isolated patches to all parts of the surface often in a few days' time.

The patches on the scalp do not differ materially from those of ordinary *trichosis furfuraceæ*, save that the surface is, perhaps, slightly more raised and inflamed, and produce more irritation. On parts of the body not covered with hair they spread less rapidly, starting from a single point or hair follicle, and extending in all directions, forming circular and oval patches of greater or less

size. The patches are slightly elevated above the surrounding surface. red, and covered with scales and little elevations marking the position of the hair follicles. The color of the patches is deeper, and the irritation and itching more severe than in ordinary *trichosis.*

In less than a week after a kitten affected with this disease comes in contact with a child, the eruption begins to show itself upon some parts of the surface of the latter, usually about the hands, arms, and face, especially if the child has been caressing the kitten. Soon after, patches appear on the limbs and body and rapidly spread, producing an intolerable itching, which is only partially relieved by rubbing and scratching the patches. This is purely a local disease, it being contracted alike readily by the healthy and diseased.

Pathology.—The cells of the hair-follicles, and of the epidermic layer between them, are shrunken and shrivelled, and the hairs, diminished in size, become brittle, and break off and crumble away. The deeper parts of these follicles become enlarged often, and the hairs die, shrink, and fall out.

The capillary vessels in the papillary layer of the skin beneath the diseased surface become congested and enlarged, producing a reddening of the skin and a slight elevation of the diseased surface. The epidermic cells of the follicles and plane surfaces are robbed of their nourishment, become diseased and shrivelled, and finally die and fall off in dry scales. Frequently the irritation is so great that pus is formed in little vesicles, which become broken by scratching.

Cause.—The cause is purely local, and has nothing necessarily to do with constitutional derangement. It is simply a fungus, a mucedinous growth, that develops primarily in the epidermic cells saturated with the fermenting milk of the cat, which, during nursing, becomes smeared over the faces of the kittens. It does not appear to be readily transmitted from the kittens to the old cat. It does not appear, so far as at present traced, to be a disease prevailing to any great extent among cats, save during the period of nursing, and from one to three months succeeding. This plant is unlike the species that develops in human milk. For the purpose of distinguishing it I have given it the specific name, *Felinis.* This fungus finds a fit soil for its growth in the skin of persons of all ages. The cells of the epidermis, however, of the

young are more tender, and better supplied with nourishment than those of the mature and old. Hence this disease more readily attacks, and more rapidly spreads over the surface of the former.

In ordinary ringworm (*trichosis furfuraceæ*), the fungoid cause exists mostly in the spore state. The plant does not advance beyond its cell condition. Its growth seems to be confined simply to cell multiplication by pullulation. In this disease the plant cells multiply by pullulation, and these advance to the filamentous stage of growth. These filaments are found running through among the cells of the epidermic layer.

Treatment.—This being a disease produced by a cryptogamic cause, any substance which retards the growth of, or destroys this kind of vegetation, becomes a more or less useful remedy. Among the agents of this class may be mentioned tr. ferri chloridi; tr. iodini; dilute sulphuric acid; dilute nitric acid; dilute hydrochloric acid; dilute nitro-muriatic acid; ointment of the per nitrate of mercury; dilute ointment of per nitrate of mercury, made with cod-liver oil; creosote; solutions of sulphurous acid; solutions of soluble sulphites; strong solutions of quinia, etc. In short, all anti-fermentative substances; or, all those bodies that prevent yeast from exciting fermentation in saccharine and farinaceous materials, or that tend to prevent animal tissues from undergoing fermentative changes, become useful remedial agents in diseases caused by parasitic fungi. Under ordinary circumstances this plant, probably, will not grow upon the healthy body. It is quite likely that it only becomes capable of developing in such situations, after becoming animalized—so to speak—by developing either in the dirty or milk-smeared and saturated epithelial tissues of the cat.

One of the most ready remedies for perfectly eradicating this eruption is the tr. ferri chloridi. This should be painted over the eruption. A single thorough application will most generally destroy completely the vegetation, and effect a cure. The application of tr. ferri is attended with considerable pain in persons of thin and tender skin. When the patient is not willing to endure the smarting of this remedy, others of a milder character may be substituted. On young children, the oint. of the per nit. of mercury, made with cod-liver oil and the dilute citrine ointment, will be found excellent remedies. The mineral acids, when used, should be sufficiently diluted,

so as not to cauterize, or produce too much irritation. They may be painted freely over the diseased surfaces morning and evening. A few days' application will suffice to effect a radical cure.

2. *Trichosis Caninis.*—This is a skin disease, affecting dogs. The eruption begins by a small pustular elevation, covered with epithelial scales; other little pustules appear around this, and, beyond these, others soon arise. In this way the disease gradually extends in all directions from the starting-point, from follicle to follicle, producing circular and oval patches elevated above the surrounding healthy surface about one line, and covered with dry epithelial scales, rolled and twisted up. The patches extend, and have a shape like that of *trichosis furfuraceæ*, on the human subject. Like the last-named disease, this is cryptogamic. It is produced by a parasitic mucedinous growth, which develops among the epithelial cells of the epidermis, passing down among the cells of the hair, sweat, and fat follicles of the skin, depriving them of nourishment. This causes them to sicken, shrivel, and dry up, die, become detached and fall off in dry scales. The cells from which the hair is supplied with food and cell elements becoming diseased, the hair becomes imperfectly nourished, shrivels up, dies, and falls from the follicles. This disease attacks all parts of the surface of the dog. Young dogs are more susceptible to it than old ones; yet no age is exempt. It resembles closely the *trichosis felinis* of kittens; but appears to differ from it in this particular, to wit: that the fungus appears more luxuriant, large, and is more confined to its filamentous stage of development. It attacks less the hair follicles than the felinis, and extends more generally to all parts of the epidermic cell surfaces.

These diseases may, however, be both produced by the same specific cause, the difference arising mainly from the difference in the animal cell surfaces in which they are developed. On account of this and other characteristics, I have designated these diseases by two distinct names. The development of these two growths, to their fruiting stage, will alone settle the question as to the identity or difference of the cause in these two diseases. This part of the investigation is now in progress, and I hope to soon be able to say positively whether there is or is not a difference as to cause between these diseases.

Pathology.—The cells of the epidermis, deprived of their normal nourishment, become shrivelled, dry, and smaller in size, and separate from each other to a greater or less degree. This drying and separation of the cells causes the diseased surfaces to rise above the surrounding healthy parts, the dead, dried, and curled-up cells separate and fall off, presenting a bran-like appearance. The cells of the hair follicles are affected in the same way as the plane surfaces; the hairs sicken, become small and shrivelled, die, and fall from the follicles, leaving the surface bare and inflamed.

Cause.—This is purely a local disease, produced by the development of the cells and mycelium of a mucedinous fungus among the cells of the epidermic layer of the skin. The mycelium is found developing more abundantly than the cells. The mycelium sends out filaments in all directions, branching and rebranching, forming a close network in the cell layer. As the fungoid filaments extend in all directions from the starting-point the disease extends. The development of this fungus deprives the epidermic cells both of the plane surfaces and the follicles of their nourishment. This causes them to sicken, die, shrivel up, separate, and exfoliate.

Treatment.—This disease is readily cured by the application of the tr. ferri chloridi. A few applications suffice. One application each day is sufficient. After several applications of the tincture, it may be well to apply the dilute citrine ointment, morning and evening, till the surfaces become soft and healthy. The mineral acids, the soluble sulphites, creasote, and all anti-fermentative substances, are curative agents in this disease.

This disease is transmissible to the human subject; but, so far as examinations and investigations have at present gone, it is much less readily communicable than the *trichosis felinis.* It is much more readily transplanted upon children than upon the mature and old.

It attacks all parts of the body alike readily. It usually, however, first attacks the hands, arms, and face; other parts of the body being more or less protected with clothing.

History of Investigations.—Without troubling the reader with the tedious details of the investigation, I will here briefly state that this disease was first noticed by myself to be peculiar in the summer of 1864, while treating it in

an orphan asylum, where some thirty small boys were affected with it. During the following year quite a number of cases of the disease were under my care. It was not, however, till July and August, 1866, that I commenced studying the disease with the view of tracing its source.

I had noticed that in most families where it prevailed, the children were playing with kittens that had diseased faces. On comparing the mucedinous growth on the kittens with that on the diseased children, they were found to be apparently identical in the shape of the spores, and in the arrangement of the epidermic cells. My next experiment was to procure a number of diseased kittens, and distribute them to families where there were no cats, and where the children were all free from the disease. In every instance, in from five to ten days after the children began playing with the diseased kittens, they commenced breaking out with this eruption. The next step was to inoculate myself with the spores of this fungus from the cat. In about three days they began to develop rapidly, and send out filaments in all directions among the epidermic cells, producing a disagreeable itching, and forming circular and oval patches of eruption precisely like the disease previously described. The eruption yielded readily to treatment.

I now inoculated myself with the spores from the patches of eruption on a healthy child, to whom I had given, about two weeks before, a diseased kitten. The characteristic eruption followed, extending in all directions from the points of inoculation. Many other experiments were made, connected with the disease, both on the cat and dog, a detail of which would be here uninteresting and unnecessary.

Without further comment or apology this brief description is offered to the profession, hoping the subject may be of sufficient interest to induce others to make investigations in the same direction.—*Am. Jour. Med. Sciences, April*, 1867.

Herpes Circinatus from Favus in the Cat.

Dr. Tilbury Fox exhibited to the Pathological Society of London, November 13, 1866, several specimens of parasitic fungi sent to him by Dr. Purser, of Dublin—one from a favus patch on the paw of the cat, the others

from herpes circinatus (tinea circinata) of the arm produced by inoculation with the fungus (achorion) from the favus of the cat. It appears two cats were affected by favus, the one already mentioned, and a second about its nose; attempts were made by one of the ladies in the house to rub off the crusts from the diseased places in these cats, and very shortly afterward tinea circinata showed itself about her hands, arms, and shoulders; three other inmates (females) were similarly attacked. The disease was most carefully diagnosed, and not a feature of favus showed itself. Dr. Purser then inoculated his own arm, and produced what was pronounced to be tinea circinati (herpes circinatus); he sent some of the scales to Dr. Fox, which were exhibited. There was an absence of spores, but mycelial threads were very abundant. They were smaller, less branched, and more devoid of granules than the achorion-tubes, characters which belonged to trichophyton. The cases were interesting as showing that favus may give rise to other forms of parasitic disease, a view which Dr. Fox holds against many authorities, and he remarked that DeBury's recent experiments show conclusively the difficulty of getting an interchange of characters between varieties of the same fungus.—*Med. Times and Gazette, Nov.* 17, 1866.

[The above statements are to a considerable degree confirmatory of the researches of Professor Salisbury, related in the present number of this journal, pp. 379–383. It is but justice to Dr. Salisbury to say that his paper was sent to us early in November of last year, and was intended for the January number of this journal, but in consequence of the impossibility of having the wood cuts done in proper season, it was laid over till the present number.—[*Ed. Am. Jour. Med. Sciences, April*, 1867.

Therapeutic Effects of the Bromide of Potassium.

Dr. James Begbie in an interesting article (*Edinburgh Medical Journal*, December, 1866), states that after some years' use of the bromide of potassium he has become satisfied of its great value in the treatment of many diseases, but more especially in disorders of the nervous system, affections of centric origin, or of remote parts through reflex action.

1. He asserts, and this assertion can be confirmed by all who have employed the bromide of potassium, that it is a valuable sedative and hypnotic, and it will often tranquilize when narcotics fail. A dose of from twenty to thirty grains dissolved in a wineglassful of water, or of orange-flower water, given at bed-time, repeated in the morning, and persistently employed for days or weeks, will often produce tranquillity in the sleeplessness during convalescence, and after surgical operations.

"2. In those distressing nervous affections, the offspring of overtaxed brain, which we are ever and anon called upon to combat in the case of the earnest student, the plodding man of business, or the speculating merchant, cases where, by rising early and sitting up late, neglecting regular hours of diet, and abandoning exercise in the open air, the whole machinery of life and health have been deranged, and the unhappy victims contemplate nothing short of the wreck of mind and body: in these circumstances, next to rigid hygienic rules imposed by the physician, and carefully carried out by the patient, will be found the amelioration and ultimate removal of the evil, in the use of remedies which have a calmative effect upon the nervous system. Of these the bromides, in my experience, are the safest and the best. * * * Associated with the cerebral disorder of giddiness and sleeplessness, we often find perversion of the external senses, such as rushing, ringing sounds in the ears, etc. These I have found to be quelled and silenced by the use of the bromide, which may be successfully administered in all cases of hyperæsthesia."

3. In that distressing nervous disorder brought on by masturbation, he has repeatedly satisfied himself that the remedy in question is a trustworthy agent.

4. In various shades of epileptiform disorder, and even epilepsy itself, resulting from the nervous condition brought on by the practice just alluded to, Dr. B. states that the bromides exercise a powerful influence. Dr. B. has never seen any evil result from its long continuance; the system acquires a tolerance of its employment.

5. In acute mania and delirium tremens he considers that for procuring calmative and sedative effects, the bromide will be found safer than opium, antimony, aconite, and digitalis. "I have seen," he states, "in two recent cases of violent maniacal excitement, a dose of thirty grains of the bromide of potassium, administered

every second hour, reduce to quietness the restless subjects, and lay them down in sleep, of which they had for days been deprived. I have not much experience of the remedy in delirium tremens, but I know that it is now on this trial, and I entertain little doubt that it will be successful. In one case its use has been followed by satisfactory results, quickly calming the agitation and excitement, and inducing sleep. In nymphomania, the bromides have been employed with marked success, and Dr. James Struthers informs me that he has obtained most satisfactory results from the administration in puerperal mania. This experience is confirmed by that of other physicians engaged in obstetric practice. In melancholia, attended with fixed delusions and great restlessness, I have found the bromide a powerful calmative."

6. In several affections of the larynx and bronchi, which there is reason to believe have a cerebral origin, or, at least, an intimate connection with the nervous centres, as hooping-cough, laryngismus stridulus, spasmodic croup, and spasmodic asthma, he has found the bromides to possess anæsthetic powers not inferior to any of the narcotics. In spasmodic asthma, Dr. B. has obtained the most satisfactory results from the employment of the bromides. "In two cases of long standing, which had resisted all approved methods of treatment, and where the patients had renounced all hope of benefit from drugs, the use of the bromide of potassium in full doses, night and morning, was followed by a remarkable remission of the fit—the patient in one case having slept for several consecutive nights without the return of the asthmatic paroxysm, a circumstance which had not occurred for years. In the second case the result was equally satisfactory."

7. Dr. B. has found the bromide useful in certain cases of vomiting, and in other affections in which the ganglionic nervous system is disturbed.

8. Considering the nervous element present in diabetes, and the sedative effects on the nerves of the bromide of potassium, Dr. B. was induced to hope for beneficial effects from this salt in that disease, and he briefly relates four cases in which it had been employed. "These cases," he remarks, "sufficiently show that there are forms of diabetes in which the functional derangement of the liver, and the production of sugar, are arrested by an agent whose operation is that of a sedative to the

nervous system. It would be premature at the present moment to speculate on the amount of success that may attend the exhibition of the remedy in the varying circumstances in which the disease presents itself."

"9. The phenomena of cholera, in its earlier stages," Dr. B. remarks, "point to its intimate connection with disorder of the ganglionic system of nerves, with irritation of the nerve-centres and vaso-motor nerves, and with spasm of the capillary vessels, and obstructed circulation. To arrest this condition as early as possible seemed a clear indication of treatment; and the bromide of potassium, as possessing decided power in allaying irritation of the nervous system, and of relaxing spasm of the muscular fibre, was proposed by me as a possible means of allaying at least some of the more urgent symptoms of the disease. It was introduced into practice upon no empirical ground, and with no expectation that it was to be found a cure for the disease. The very first trials of it in the Leith Cholera Hospital were such as to justify the confident hope that it would be found useful; and its subsequent employment there, as well as in the Edinburgh Cholera Hospital, has not disappointed expectation. In the two institutions named, the former under the superintendence of Mr. Niven, the latter under that of Dr. Stevenson Smith, and also in private practice, I have had many opportunities of witnessing its effects, and am now prepared to say that the bromide of potassium, though not possessing the properties of an antidote to the poison of cholera, though not a specific to the shock of this terrible disease, has certainly stript it of some of its terrors."

10. In the treatment of the nervous element in fever, we have, Dr. B. says, in the bromide of potassium an excellent substitute for opium, and antimony, henbane, camphor, and other sedatives. "A sufferer from quotidian ague, after large and repeated doses of quinia during the interval, had his regular accession of cold, and hot, and sweating stages unaffected by the specific. The sweating stage was usually protracted and exhausting, and at the end of a fortnight no mitigation was effected. He was advised to take a full dose of the bromide of potassium every three hours during the remission, and, with one imperfect paroxysm, he got quit of his malady."

11. In obstinate cases of neuralgia, which have resisted the usual remedies, "when no palpable or suspected organic mischief gives rise to the want of success in the use of well-tried and approved remedies, and when no constitutional diathesis stands in the way of well-directed skill to overcome; in those anomalous forms of neuralgia let me ask a trial of the bromide of potassium. It will, now and then, in its own gentle way, reprove the employment of the more heroic treatment which had anticipated its use, and demonstrate that a calmative, in such cases, frequently succeeds better than a counter-irritant."

12. Lastly, Dr. B. has tried the bromide in two cases of "exophthalmic goitre" with the effect of calming the system, though without curing the disease.

Dr. B. has used a gargle composed of one ounce of the bromide of potassium in a pint of water in irritable sore throat with marked advantage.—*Am. Jour. of Medical Sciences, April*, 1867.

EDITORIAL AND MISCELLANEOUS.

[The following "Suggestions" having been received too late to be inserted among the original communications of this issue of our Journal, we take the liberty of presenting it to our readers in this place, in order that it may prove useful to those engaged at this season in the preservation of medicinal plants.—Ed.]

Suggestions on the Preservation of Plants and Vegetable Substances. By George W. Rains, M.D., Professor of Chemistry and Pharmacy in the Medical College of Georgia.

The usual method of preserving plants and flowers for pharmaceutical purposes, by drying them in hot chambers, and afterwards storing them in boxes or cases of tin or wood, or in glass or earthen jars, is open to several

objections as commonly performed. Too often but a remnant of the more delicate odors and flavors remain after the process is completed, and even this is mainly lost after being kept for a few weeks or months.

It is well known that the actinic or photogenic rays accompanying light have a strong effect in producing chemical action, and hence many vegetable colors are speedily injured by exposure to too much light. This, whilst it stimulates and is altogether necessary for the growth of the plant and formation of its odors and active principles, produces in many cases the reverse effect after the vegetable has been deprived of its vital forces. This is a fact more or less familiar to all, hence it is evidently necessary to properly preserve vegetable colors and properties that the plants or substances should be as far as practicable excluded from light.

To dry flowers and plants in the sun's rays would be obviously wrong, whilst if dried in the shade, or in a cool room, there is too much time for chemical action in the juices, producing a material change of properties in many cases.

A dark hot chamber is certainly better, but in this case a considerable loss of the more volatile substances is experienced.

Probably the most perfect drying arrangement is that used in the chemical laboratory for desiccating compounds which would be injured by heat, viz.: being placed into glass vessels over dishes of strong sulphuric acid in a vacuum.

In case an air pump is not at hand, then the plants might be placed in a close box having the dishes of acid at the bottom, the whole being kept at blood heat. Quick lime may be employed in place of the acid, but the latter is preferable from its stronger absorbing power for watery

vapor, and not being injured by the operation, becoming only slightly diluted, there is no loss in the process.

After the vegetable substance or plant has been thoroughly dried, it should be immediately excluded from air and light as perfectly as practicable; to effect this in the best manner, requires some consideration. By exposure to air not only is there a slow volatilization of the aroma of essential oils, but also there is a gradual combination with the oxygen of the air to the detriment or destruction of some of the most valuable properties.

Packing closely the dried substance in a glass vessel or tin box, would in general answer, if it were left undisturbed, but if portions be wanted for use from time to time, the case must necessarily be opened and an air space left above the article, which becomes larger and larger as more is abstracted; hence the exclusion from air in such case is a failure.

The packing box or envelope should evidently be of such a nature or construction as to be able to accommodate itself to the decreasing bulk of material as portions are taken for use, and thus prevent a vacant air space being left.

I have found an excellent envelope in the common India rubber cloth, which seems to answer all the requirements remarkably well—excluding effectually both air and light, as well as accommodating itself to the decreasing volume of the dried substance as portions are used, and allowing ready access to the material. Through its agency I have succeeded in preserving even the very delicate aroma of parched and ground coffee berries for several months without material loss, and can strongly recommend its general employment for such purposes.

ERRORS IN RELATION TO LIVER COMPLAINTS.

To attribute a great variety of symptoms to affections of the liver is one of the commonest errors of the age. "My liver is out of order," is one of the first announcements made to the physician who asks his patient "what is the matter?" The liver is held accountable for headaches, pains in the shoulder, sides, back, and limbs; dyspepsia, diarrhœa, dysentery, constipation, foul tongue, coughs, etc., etc. A very sensible lady consulted me the other day for her child who had an ordinary sore throat, and insisted upon being permitted to administer a dose of calomel, for she knew that the child's "liver was out of order," and that nothing else would relieve it. Upon being asked how she knew that the liver was out of order, she promptly replied that she knew it because the child had a foul tongue and no appetite! A gentleman brought me his son, about seven years of age, and stated that he had called to get me to decide what was the matter with the boy. He knew that his son either had worms or that his liver was out of order, for he was puny, did not rest well at night, and had withal symptoms of St. Vitus' dance. He had intended to administer a dose of calomel, "for that is good for the liver as well as for worms;" but his wife had persuaded him to consult me, and he, as a dutiful husband, had yielded to her request. A physician of standing seriously declared to a gentleman who was prematurely grey, that this was due to the fact that the liver was out of order, and that if he would take a few large doses of calomel his hair would cease to turn white. The gentleman being in perfect health, and not overly fond of physic, preferred to remain as he was, and

science has accordingly been deprived of the result of so interesting an experiment!

We might multiply such cases *ad infinitum*, and perhaps *ad nauseam*. But what is the reason of this strange disposition to overlook what is patent, and to grope in search of the occult? Why ignore what is evident, to look for what is hidden? Is it because the naked truth is too simple, and that our vanity is flattered by the idea of being able to unveil the concealed mysteries of nature?

With the exception, indeed, of the variations in the quantity of the biliary secretion, the diseases of the liver are by no means easily detected. The secretion of bile is only one of the functions of this organ, and the affections which do not modify this act, are of difficult diagnosis, even to accomplished physicians. It is easier, therefore, to prefer charges against the liver than to refute them, and this affords a safe refuge for ignorance. It is not our purpose to deny the existence of hepatic affections; but to expose the fallacy of attributing other diseases to the liver. Nearly all medical writers believe hepatic affections to be more common to warm than to cold climates, and if this opinion were restricted to modifications peculiar to our fevers it would undoubtedly be correct. But, according to my observation, all the other forms of liver disease are more common in the Northern States of this Union, and in London and Paris, than they are in this latitude. The works on pathological anatomy are full of illustrations obtained in colder climes, which we scarcely ever see in this section of country. I saw more of such affections during my attendance upon the hospitals of Europe than I have seen in the whole of my professional career here. L. A. D.

The Principles and Practice of Obstetrics. By HUGH L. HODGE, M.D., Emeritus Professor of Obstetrics and Diseases of Women and Children, in the University of Pennsylvania; Consulting Physician to the Philadelphia Dispensary; Fellow of the College of Physicians of Philadelphia; Member of the American Philosophical Society, etc., etc. Illustrated with 159 Lithographic Figures from original Photographs, and with numerous Wood Cuts. Philadelphia: Henry C. Lea; 1866.

The Principles and Practice of Obstetrics. By GUNNING S. BEDFORD, A.M., M.D., Professor of Obstetrics, the Diseases of Women and Children, and Clinical Obstetrics, in the University of New York; Author of "Clinical Lectures on the Diseases of Women and Children." Illustrated by four Lithographic Plates and ninety-nine Wood Engravings. Third Edition, carefully Revised and Enlarged. New York: William Wood & Co.; 1866.

Obstetrics; The Science and the Art. By CHARLES D. MEIGS, M.D., Lately Professor of Midwifery and the Diseases of Women and Children in Jefferson Medical College at Philadelphia, and one of the Physicians to the Lying In Department of the Pennsylvania Hospital; Member of the Society of Swedish Physicians at Stockholm; Member of the American Philosophical Society, etc., etc. Fifth Edition, Revised; with 130 Illustrations. Philadelphia: Henry C. Lea; 1867.

During the past and present year, the above most valuable contributions have been made to obstetric science and literature.

Professor Hodge's work on the Principles and Practice of Obstetrics we believe to be the most complete and perfect system of midwifery ever published, in the English or any other language.

Dr. David D. Davis' Obstetric Medicine is a much larger and more comprehensive book, two large quarto volumes, comprising dissertations on the diseases of women and children, as well as midwifery proper. Prof. Hodge's work is one very large quarto volume, containing five hundred and fifty double-column pages, confined strictly to the principles and practice of obstetrics, illustrated by numerous plates, splendidly executed.

Of the merits of this work we can not say too much. It is too extensive for a text-book for medical students, and indeed for many physicians, in the present impoverished state of the South; but it ought to occupy a place

in every public and college library; and we consider it indispensable to every practitioner who aspires to usefulness or distinction as an obstetrician. It will long endure as a monument to the genius, talents, and untiring industry of the truly good and able author.

We would gladly furnish a more extended notice of this comprehensive and excellent work, but it is unnecessary; the name of Hugh L. Hodge, North, East, South, and West, is a sufficient guaranty for the worth of whatever may emanate from his pen.

* * * * * *

The high estimation in which Dr. Bedford's work is held by the profession, is very satisfactorily attested by the fact that, notwithstanding the numerous good treatises on midwifery published, or republished in the United States, during the last decade, this, the third edition, has been called for, which the author has carefully revised and corrected.

A strong proof of the good opinion of obstetric teachers is its adoption as a text-book by nine colleges previous to the present improved edition.

When received last October, without observing that it had been adopted by other colleges, after examining its merits, we cordially recommended it as a text-book to the class in attendance on the lectures in the Medical College of Georgia.

This work is very creditable to the author, evincing extensive reading, careful study, close observation, and great practical experience. A most valuable book, both for students and practitioners.

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In April we were very much gratified at receiving, from the publisher, a copy of the fifth edition of Professor Meigs' erudite and excellent treatise on the Science and Art of Obstetrics.

We were delighted to find our venerable friend, and former fellow-citizen, though "old and weary with service," still warm with zeal in the cause of humanity, and full of devotion to that noble profession to which he has always been an honor, and which has ever delighted to honor him; when his great age and long labors might well entitle him to an honorable discharge from service, and to the enjoyment of sweet repose, blessed as he is, with all "that which should accompany old age."

"As honor, love, obedience, troops of friends," it is glorious to behold "the old man eloquent," with indomitable energy and untiring industry, by day and by night, laboring to perfect his benefaction, and render his last donation to humanity, an offering worthy the illustrious donor.

The original edition is already so extensively and favorably known to the profession that no recommendation is necessary; it is sufficient to say, the present edition is very much extended, improved, and perfected.

Whilst the great practical talents and unlimited experience of the author render it a most valuable acquisition to the practitioner, it is so condensed as to constitute a most eligible and excellent text-book for the student.

J. A. E.

Practical Dissections. By Richard M. Hodges, M.D., formerly Demonstrator of Anatomy in the Medical Department of Harvard University. Second Edition, thoroughly revised. Philadelphia: Henry C. Lea; 1867.

We have carefully examined this very neatly bound volume, and advise its use to students, who will be aided by it very much in their dissections. The author's reasons for the absence of plates are worthy of consideration.

F.

A Treatise on the Principles and Practice of Medicine; designed for the use of Practitioners and Students of Medicine. By Austin Flint, M.D., Professor of the Principles and Practice of Medicine in the Bellevue Hospital Medical College, and in the Long Island College Hospital, etc., etc. Second Edition, revised and enlarged. Philadelphia: Henry C. Lea, 1867; 8vo.; pp. 970.

This work has the merit of having been written by a practical physician, possessed of more than ordinary industry and powers of observation. His previous productions had already placed him on vantage ground with the profession in this country, when the first edition of his Practice of Medicine made its appearance. This second edition will confirm his claims to a position with the foremost as an able teacher and safe practitioner.

L. A. D.

On the Action of Medicines in the System. By Frederick William Headland, M.D., B.A., F.L.S., Fellow of the Royal College of Physicians, etc., etc. Fifth American from the fourth London Edition, Revised and Enlarged. Philadelphia: Lindsay & Blakiston, 1867; 8vo., pp. 431.

This excellent book may now be said to have become classical, for it has been firmly established as the best of its kind, and is therefore entitled to a place in every library, *after having been carefully read.* We can not recommend it too highly. L. A. D.

Guide for using Medical Batteries: Being a compendium from his larger work on Medical Electricity and Nervous Diseases, showing the most approved apparatus, methods, and rules for the Medical employment of Electricity in the treatment of Nervous Diseases. By Alfred C. Garratt, M.D., Fellow of the Massachusetts Medical Society, and member of the American Medical Association. Philadelphia: Lindsay & Blakiston, 1867; 8vo., pp. 180.

The use of Electricity in the treatment of diseases is daily becoming better understood and systematized. Its beneficial effects, which long remained doubtful, are consequently now generally conceded. This "Guide" will be found essential to those who may desire to avail themselves advantageously of this interesting agent.

L. A. D.

The Science and Practice of Medicine. By WILLIAM AITKEN, M.D., Edinburgh, Professor of Pathology in the Army Medical School; Corresponding member of the Royal Imperial Society of Physicians of Vienna, etc., etc.; Formerly Demonstrator of Anatomy in the University of Glasgow, etc. In 2 vols. From the fourth London Edition, with additions by Meredith Clymer, M.D., late Professor of the Institutes and Practice of Medicine in the University of New York, etc., etc. Vol. II. Philadelphia: Lindsay & Blakiston, 1866; royal 8vo., pp. 1,078.

We have had occasion to notice this work upon the reception of the first volume. The second volume has just been received, and it affords us pleasure to recommend it to the profession. The additions of Dr. Clymer to this volume alone exceed 300 pages. The work altogether contains such an extensive exposé of practical medicine that it may be consulted with advantage even by the most experienced physician. L. A. D.

An Index of Diseases and their Treatment. By THOMAS HAWKES TANNER, M.D., F.L.S., Member of the Royal College of Physicians, etc. Philadelphia: Lindsay & Blakiston, 1867; royal 8vo., 397 pp.

This is the very counterpart of the large work of Dr. Aitken—and yet it is not without value, if used only as a remembrancer by one already well versed in his profession. But if adopted by students as a short road to that minimum of knowledge required in the "green room," it can not be otherwise than injurious. L. A. D.

Why Not? A Book for Every Woman. The Prize Essay to which the American Medical Association awarded the gold medal for 1865. By HORATIO ROBINSON STORER, M.D., of Boston, Surgeon to the Franciscan Hospital for Women; Professor of Obstetrics and the Diseases of Women in the Berkshire Medical College, etc. Issued for general circulation, by order of the American Medical Association, etc. Boston: Lee & Shepard; 1867.

The subject of criminal abortions is becoming one of intense moment, and this small volume, from the pen of so eminent a medical man, should be accepted as a warning to all who may be tempted to commit the crime. It comes adorned with the seal of the American Medical Association, and the world should receive and endorse it as a book calculated to do much good. F.

MEDICAL ASSOCIATION OF GEORGIA.

The notes furnished us of the proceedings of the recent meeting of the Medical Association of Georgia, convened at Griffin, Georgia, were imperfect, and we now renew the subject, a fuller report having been furnished since the publication of our last number.

The paper read by Dr. Wm. P. Holt, of Macon, Ga., which is published in this number, elicited an interesting discussion.

Dr. Flewellen reported a plan, extemporized by him some years ago, to accomplish forced delivery, which he thought would generally obviate the necessity for this unusual and dangerous operation of section of the cervix uteri.

It was in the case of a lady about seven months advanced, who, without any other apparent cause than that of pregnancy, was seized with obstinate and uncontrollable vomiting, which persisted for several days, in spite of all efforts to arrest it, and until it became evident that she must die without the accomplishment of speedy premature delivery.

To effect this, a *toy* balloon of pure india rubber was procured, a portion of its wall cut away, a flexible catheter introduced through the aperture, and the india rubber bag drawn over the end, or laid in plaits as smoothly as possible the distance of several inches along the catheter, and tied around it so securely as to prevent the passage of fluid.

The catheter thus surmounted was passed through the cervical canal, the cervix resting about midway the bag. The nozzle of a suitable syringe was then adjusted to the external open end of the catheter, and cold water gradually forced through it—thus expanding the rubber bag into the form of an hour-glass—the constriction repro-

senting the part within the canal, and the bulbous parts the expanded extremities of the india rubber sac—one being within the internal, and the other without the external os uteri.

Dilatation and speedy delivery were accomplished without bad results.

Dr. DeS. Ford, of Augusta, mentioned a case of the kind, where the hypodermic administration of a grain and a half of sulphate of morphia, introduced at intervals within three hours, succeeded in dilating the os and permitted forced delivery. The woman was a *prima para*, thirty-eight years of age, and was fast sinking, having been in labor five days. The operation of bilateral incision of the cervix uteri, he believed, was not so dangerous as is generally supposed.

Dr. Powell, of Atlanta, discussed the subject at some length: stated that the operation, under many circumstances, was certainly justifiable; but the necessity for such interference should be determined by a thorough knowledge of the symptoms, which indicate that the labor, if left alone to nature, would jeopardize the safety of the mother; alluded to many of the circumstances or obstacles justifying and even requiring the operation. Unyielding rigidity of the cervix, in a healthy condition, may require surgical interference; but generally the knife will not be required, unless the extensibility of the fibres has been destroyed by disease, or become undilatable in consequence of cicatrices. The propriety of the operation in case reported by Dr. Holt, was clearly proven. He also stated, that the principle of Dr. Flewellen's mode of producing premature labor was old; but the plan was new, practical, and ingenious.

Dr. Thomas, of Savannah, said that the plan suggested by Dr. Flewellen was of considerable importance to the profession, in connection with the production of abortion.

He then gave his views at some length on the case reported by Dr. Holt. He congratulated the Association on the prospect of a return to its legitimate work—the discussion of scientific subjects connected with the medical profession.

Dr. W. F. Westmoreland remarked that the case just reported by Dr. Holt, of Macon, Ga., was one of great interest; and as there had been, by members, some doubts expressed as to the propriety of the bilateral section of the os uteri, he felt that every member who had been called to treat cases requiring such mechanical interference, should give the Association the result of their experience.

Impressed with this duty, he now proposed to give a brief report of a case in which, in connection with Drs. L. H. Orme and J. F. Alexander, he performed the same operation.

The subject was a *prima para*, twenty-five years of age. From Dr. Orme, who had charge of the case for the first six days of the labor, he obtained the following history of the case:

On Saturday, the 25th November, 1866, labor commenced, and continued with more or less intensity until the following Wednesday, when the membranes were ruptured. There was no dilation of the os up to this time.

After the "waters" were discharged, the pains increased in intensity until they were almost unendurable. At no time, notwithstanding the most terrible pains, did the os dilate to more than the size of a Mexican dollar.

On Friday, the seventh day of the labor, he saw, with Drs. Orme and Alexander, the case for the first time. The patient, at that time, was greatly exhausted, a little delirious, with frequent and feeble pulse; the os was dilated to the size of a silver dollar, the edges thick and rigid, presenting a cartilaginous feel.

It resisted every effort at mechanical dilatation. Upon consultation, it was decided to make a bilateral section of the os uteri, and deliver with the forceps. He made the section with a pair of scissors, extending the incisions from an inch and a half to two inches on either side. It was not found practicable to deliver with the forceps, and craniotomy was then resorted to; and after considerable difficulty, delivery of a well-formed child was finally accomplished. The patient did not rally, but continued to sink; and died in ten hours after the operation.

In this case, as in that reported by Dr. Holt, the woman would have certainly died with the child in utero, but for some mechanical interference.

The choice in such cases is between a section of the os and Cæsarian section.

It was unnecessary to discuss the relative dangers of the two operations to the mother. He did not regard the section of the os uteri, under such circumstances, as a formidable operation. That Dr. J. Marion Sims had demonstrated that complete section of the neck of the uterus could be made without inducing any unpleasant symptoms; that in sterility, the result of some forms of mechanical dysmenorrhœa his favorite plan of treatment was the bilateral section of the neck, extending to the internal os. While he admitted that there would be more risk in making a section of the gravid than the non-gravid uterus, still, Dr. Sims' operations upon this organ has taught us that such operations are not so formidable as was once supposed.

The fear of wounding the peritoneum should not deter us, as the portion of the uterus incised corresponds to the neck in the non-gravid uterus, and has no peritoneal covering.

He suggested that four or five sections or incisions would perhaps give more space for the passage of the

child's head than the bilateral section; that in the next operation of the kind that he was called on to perform, he should adopt this plan.

Dr. Charters, our worthy President, then yielded the chair to Dr. T. S. Powell, first Vice President, for the purpose of giving his views on the subject.

Dr. J. F. Alexander reported a singular case of a citizen of Atlanta, who, upon entering his room, began combing his whiskers, and thousands of sparks were emitted and fell to the floor; and farther, that when he would grasp a common glass tumbler with his hand, it would break in pieces.

Dr. A. W. Griggs, of West Point, was then conducted to the stand, and entertained the Association in an able and eminently creditable manner upon the subject of electrical forces as connected with intermittent fever.

A Committee was appointed to prepare an Address to the Public on the true relations of charletans and their nostrums to legitimate medicine, to report at next meeting. Committee—Drs. McDowell, Holt, and Crawford.

A Committee to revise the Constitution of the Medical Association of the State of Georgia, to report at next meeting. Committee—Drs. W. F. W. Westmoreland, Griggs, Ray, Banks, and Myers.

A Committee to present a report of the Medical Topography of the State, to report at next meeting. Committee—Drs. Griggs, Thomas, Flewellen, Alexander, and DeS. Ford.

A Committee to report upon the medicinal properties and uses of the various unofficinal indigenous plants of the State of Georgia, and other States with which they may be familiar. Committee—Drs. J. G. Westmoreland, Charters, Crawford, Geddings, and Hammond.

STANDING COMMITTEES.

Committee to prepare sketches of the life and character of those members of the Association who have died since the meeting of 1861—Drs. DeS. Ford, Banks, and Logan.

Committee to examine Prize Essays—Drs. Banks, J. G. Westmoreland, DeS. Ford, Drewry, and O'Keefe.

Committee to memorialize the Legislature on registration of births and deaths—Drs. Habersham, Westmoreland, and Word.

The Association offers One Hundred Dollars for three Essays—Fifty Dollars for the first, Thirty Dollars for the second, and Twenty Dollars for the third—or medals, amounting to the same, as the Essayist may prefer.

We sincerely trust that the members of these Committees, thus appointed, will become so much interested in the annual meetings of our Association that they will prepare full reports, which will undoubtedly prove of great instruction and value.

Lithotomy in a Female. By John Stone, M.D., of Linton, Ga.

We have received from Dr. Stone a letter in which he gives us an account of an interesting operation for the removal of a large calculus from a woman, by means of an incision of the urethra and the use of a pair of ordinary bullet forceps. We regret that lack of room prevents us from giving the details in full.—[Ed.

Pathology of Cerebral Softening.

Two Parisian hospital *internes*, MM. Prevost and Cotard, have diligently availed themselves of the opportunities afforded them during their residence at the Salpetrière, of studying the pathology of cerebral softening. In addition to noticing the appearances presented in the brains of persons dying with softening of the brain, they have, by the advice of M. Vulpian, produced artificially in animals some of the symptoms attending this morbid condition. Their researches, and the conclusions derived therefrom, were last year communicated to the Société de Biologie, and have appeared in various numbers of the *Gazette Médicale de Paris* for the present year. Their object, they state, has been to determine the true relation of obstruction of the blood-vessels to cerebral softening. No one, they say, denies in the present day, the part which obliteration of the vessels plays in the production of softening of the brain; but are all cases of softening to be attributed to this cause? Having related and commented on a number of experiments and *post mortem* examinations, and given a general summary of the results, MM. Prevost and Cotard remark, that they have not studied every point in the history of cerebral softening. This was not their intention; their purpose has been to offer some new considerations, and to elucidate some still obscure points. They have taken no notice of the various kinds of inflammatory softening. The following are the principal conclusions at which they have arrived.

Experiments on animals (consisting in the injection into the vessels of lycopodium or snuff) has enabled them, by means of these artificial emboli, to produce softening identical with that which is observed in man, and to follow its progress through various stages. In this way they have been able to study the hyperæmia which is first produced, and necrobiotic degeneration which follows, and, finally, the production of connective tissue and the formation of yellow patches which belong to the third period of softening. Analogous experiments have already been made by MM. Virchow, Cohn, Panum, etc.; but the procedures employed by them have produced death too rapidly to allow them to study softening in its different phases. From their experiments, MM. Prevost and Cotard have ascertained that ordinarily a distinct conges-

tion is produced at the points where the obstructed artery is distributed. The cause of this hyperæmia it is difficult to determine at present; but, whatever may be its mechanical cause, the hyperæmia of red softening must be considered as of an entirely different nature. As early as the third day, there are present well-defined granular bodies, and a large number of fatty granulations not yet agglomerated; these are collected around the capillaries, forming, as it were, a sheath to these vessels. In some instances, the walls of the capillaries have presented consecutive granular and fatty degeneration; and, in one case, dissecting aneurisms were formed. In a dog which survived the experiment fifteen days, a true yellow patch was found in the cerebral convolutions.

The study of cases at the Salpêtrière, in which cerebral softening has been found after death, has led the authors to consider the process very analogous to that which they have artificially induced in animals. The necrobiotic process has appeared to them almost always to depend on arrest of the cerebral circulation, varying in origin; and they have observed a certain relation between the various forms of disturbance and the characters of the softening. The disturbance of the circulation sometimes arose from obstruction of any artery by a thrombus or embolus; sometimes from atheromatous degeneration of the cerebral arteries; sometimes, perhaps, from more or less general capillary embolism. In two cases, no cause could be ascertained; but perhaps the arterial obstruction escaped notice. None of their observations have led them to infer with certainty that softening has been due to atheromatous degeneration of the capillaries; this degeneration may be consecutive.

Phenomena of irritation are sometimes added to the process which essentially constitutes softening. In some instances, inflammation and suppuration took place around the infarctus formed in dogs; and the authors endeavor to trace a relation between these phenomena and the production of false membranes on the dura mater at the level of old foci of softening.

In speaking of the symptoms, they point out that the attacks of vertigo and the apoplectiform paroxysms followed by rapid death without lesion of the nervous centres, which most authors have ascribed to congestion, are due to impeded cerebral circulation. They endeavor to establish a direct relation between the intensity of the

attack and the extent of the interference with the supply of blood; and they show that both thrombosis and embolia may give rise to sudden death. Regarding paralysis, spasm, and other symptoms of softening, they have but little to add to what has already been said by other authors. The paralysis, they find, most frequently sets in suddenly, and rarely follows a progressive course; hence no diagnostic value can be attached to this symptom. Examination of the temperature of the rectum in some instances, and the information on this point which the authors have derived from M. Charcot, leads them to conclude that the temperature of the body is not essentially raised during cerebral softening; and hence that, if inflammation have any share in the process, it must be altogether secondary. It would, they observe, be interesting to make a similar series of observations in cases of inflammatory softening.—*Am. Jour. Med. Sciences, April,* 1867, from *Gaz. Méd. de Paris, July* 14, 1866.

Apoplexy of the Medulla.

M. Levier, after describing a case of apoplexy in the lumbar region, comments on the cases of medullary apoplexy hitherto reported. In the medulla oblongata, there have been nine cases, four only being pure; the results were, loss of consciousness, involuntary epileptiform movements, and sudden death. Of apoplexy in the spinal cord there were seventeen cases; in two thirds of these, the lesion was in the upper part of the medulla. The attack was rarely sudden; it was generally preceded for a week or a fortnight by pain in the spinal cord and symptoms of congestion. The first symptom is paralysis, which often occurs during sleep, and affects the sphincters; its progress is rapid, and it is not accompanied by contractions of the limbs; its extent depends on the seat of the apoplexy. Reflex excitability is destroyed. There are ordinarily greatly impeded respiration, feeble cough, difficulty in expectoration, aphonia, and impairment of speech. Paralysis of sensation generally follows that of motion; sometimes there is hyperæsthesia; the spine is not tender on pressure. Both sides, or one only, may be paralyzed; in three instances of the latter which occurred, there was paralysis of sensation on the opposite side. There is elevation of temperature in the paralyzed parts.

The duration of the disease varies from a few hours to some months. The diagnosis may be difficult. In meningeal apoplexy, there are convulsions; the paralysis of motion is less complete; moreover, it is generally secondary, occurring in the course of tetanic or convulsive affections. Congestion of the medulla is distinguished by the short duration of the paralysis, the slightness of the symptoms, and the rapid return of health.—*Ibid.*

Treatment of Diseases of the Heart.

Dr. S. O. Habershon, in an interesting paper in the late volume of *Guy's Hospital Reports*, lays down seven principles of treatment in all cases of heart disease.

The first is, as far as possible, to *lessen its work;* and this may, to some extent, be effected by mechanical rest, by a recumbent position, and by the avoidance of sudden changes of temperature.

The second is to *insure regularity of action*, by avoiding mental excitement, by guarding against indigestion, and by never allowing constipation to continue.

The third is to *lessen distension*, especially of the right side of the heart, by purgatives, diuretics, and by mechanically diminishing the quantity of fluid in circulation.

The fourth is the prevention of syncope. With this view, sudden muscular movements must be avoided; stimulants may be required, as ammonia, brandy, etc.; and sedatives must be withheld or cautiously administered.

The fifth is to strengthen the muscular fibres of the heart, by suitable nourishment, a bracing air, if other conditions allow; chalybeate medicines, and if the patient be exhausted by want of sleep, this symptom must, if possible, be relieved.

The sixth is to prevent fibrillation of the blood. For this purpose carbonate of ammonia will often be useful; other alkalies, as potash, soda, and their salts may be beneficial, but, if long-continued in considerable doses, Dr. H. says, they depress the action of the heart. The acetate and iodide of potash may be advantageously combined with the carbonate of ammonia, or perhaps the hydrochlorate of ammonia.

The seventh is to prevent secondary complications, and to relieve them when produced. These complications are —1st, broncho-pneumonia and pleuritic effusion; 2d, pulmonary apoplexy and other hemorrhages; 3d, visceral engorgement, as hepatic and renal congestions, with ascites and anasarca. By freely acting on the bowels, the portal congestion is greatly diminished, and the liver is enabled to act in a normal manner. Thus a free mercurial purge is of great value. The kidneys may be excited to a more vigorous action by a combination of mercurial medicine with squill and with digitalis, when the latter can be borne. Salivation should be avoided. Diuretics are useful. An effectual way of diminishing the anasarca is by puncturing the skin on the thighs. The pulmonary engorgement is sometimes greatly reduced by applying cupping-glasses between the shoulders, or by the application of a blister to the chest.—*Ibid.*

Etiology of Eczema.

Dr. Frank Smith, of Sheffield, has recently made some very important observations in reference to the etiology of eczema in its relation to some disorder of the renal function, as shown by the presence of indican in the urine. In nine out of ten cases Dr. Smith has detected indican in pathological quantities. Indican is supposed to be due to a retardation of the process of declension from the complex to the more simple of the products of function and secretion. Its own highly complex formula is a strong evidence in favor of this opinion, in addition to the ease with which it is broken up into leucine, indigo, and glucine. Dr. Smith suggests that this retardation is due to accumulation of urea and other products of waste in the blood, owing to deficient renal secretion; for he has detected urea in considerable amount in the serum of eczematous patients. Indican occurs in the urine in the reaction stage of cholera and in Bright's disease. The spectrum of the solution prepared from the urine for the detection of indican is the same as that of common indigo. These observations are exceedingly important and suggestive.—*Am. Jour. Med. Sciences, April*, 1867, from *Lancet, Feb.* 2, 1867.

Importance of Preservation of the Periosteum in many Operations.

Dr. William Stokes, Jr., Surgeon to the Meath Hospital, Dublin, in his introductory lecture, remarked:

"M. Ollier, of Lyons, as I mentioned previously, has directed especial attention to the importance of periosteal preservation and transplantation in many operations. In three cases he has removed large portions of the diaphyses of the long bones with favorable results. In his other cases an epiphysis of the bone had to be removed. One of these I had an opportunity of seeing, in which the upper half of the humerus was removed, with complete restoration of bone. From his experiments, therefore, and clinical experiences, as well as from those of some others who are deeply interested in this subject, and from the cases of Dr. Moon and Professor Langenbeck, the following propositions may be stated:

1. That in sub-periosteal resections the reproduction of bone is more complete and effected with greater rapidity than after total removal of both bone and periosteum.

2. That the osseous reproductive properties of the membrane vary according as it is taken from the long or the short bones, being greater in the former than in the latter (Ollier).

3. That the normal form of the joint is better preserved when this precaution of leaving the periosteal covering is taken.

4. That the sub-periosteal resections involve less danger than when conducted on the old principle. This proposition is grounded on the result of experiments on the lower animals, the number of unfavorable results which followed when the membrane was removed being much greater than when it was left.

5. That the difficulties attending the separation of the membrane in the dead subject are not to deter us from attempting the operation on the living, inasmuch as the membrane is less adherent in the latter, and also in the diseased than on the healthy bone.

6. That resections performed in this manner are more conservative, inasmuch as re-formation of the part removed is effected, and, being attended with less risk to life than the ordinary resections, a greater quantity of bone can be removed, and in this way in a number of

cases the necessity for amputation is diminished. The cases I have alluded to—of Dr. Moon in America, and Professor Langenbeck—are illustrative of the truth of this.

7. That the chances of much shortening of the limb are diminished by this method, as shown by the results of the ankle-joint resections during the late Schleswig-Holstein war.

8. That in addition to these the modified Rhino and Urano-plastic operations demonstrate that the happiest results have been obtained by this application of experimental physiology to practical operative surgery."—*Am. Jour. Med. Sciences, April*, 1867, from *Med. Press and Circular, Dec.* 12, 1866.

Diabetic Gangrene.

M. Verneuil lately brought under the notice of the Surgical Society of Paris the subject of gangrene occurring in diabetic patients, of which he had met with six instances in the course of three months. In the first case, he was called to perform amputation in a person affected with gangrene of the foot and lower part of the leg. On inquiry, he found the patient diabetic. The man, a seller of wine, had been of somewhat intemperate habits. The gangrene was said to have originated in the pressure of the shoe on the little toe, and to have been soon followed by the appearance of other gangrenous spots on the foot and leg. The man ultimately died; M. Verneuil having abstained judiciously from any surgical interference.

In the second case, that of a man aged fifty, the patient had for some time had bunions, one of which became ulcerated. As the sore observed no tendency to heal, M. Verneuil examined the urine, and found sugar. The patient ultimately died, worn out with profuse diarrhœa, marasmus, and low delirium.

In the third case, a patient in the Laribosière Hospital had an ulcer of the heel, of the size of a finger, with sharply-defined edges, and œdema of the leg. The heart and liver appeared healthy; but the urine contained both sugar and albumen. This patient also died: but nothing in the kidneys could be found that was capable of accounting for the albumen.

The fourth case was that of an ecclesiastic of high rank, about sixty-six years old. He had diabetes, with gangrene of the little toe, several eschars on the great toe, and dorsum of the foot, and an extensive carbuncular phlegmon on the sole.

In the fifth case, that of a lady, there was a carbuncle on the back. Incisions made into this producing no improvement, M. Verneuil examined the urine and found it diabetic.

In the sixth case, that of a man aged fifty-five, paralytic and subject to intermittent fever, there was a gangrenous eschar in the groin, with offensive discharge. This patient, alone of the six, so far improved under an alkaline treatment as to recover; in the other five, death occurred in a few days or weeks after the appearance of the local disease. Such cases as those related, M. Verneuil observes, point to the advisability of examining the urine before operating in cases of gangrene of the lower limbs.—*Am. Jour. Medical Sciences, April*, 1867, from *L'Union Médical, Dec.* 1, 1866.

On "Glyconine"—a new Glycerole.

To obtain this compound, M. Edmond Sichel employs four parts (by weight) of yolk of egg, and five parts of glycerin, which he mixes simply in a mortar. It has the consistence of liquid honey, and is unctuous like the fatty substances, over which it has the advantage of being easily removed by water. It is unalterable, a specimen having been left exposed to the air for three years with impunity. Applied to the skin, it forms on the surface a varnish, which protects it from the contact of the air. These properties render it serviceable for broken surfaces of all kinds, particularly for burns, erysipelas, and cutaneous affections, in which it soothes the itching, and also for sore nipples; its harmlessness prevents, in the latter case, any interruption of suckling.—*Boston Medical and Surgical Journal, March* 21, 1867, from the *Bulletin de Thérapeutique.*

Syphilis Extensively Propagated by Vaccination, in France.

In the western department of France (Morbihan) some villages have been the theatre of severe syphilitic symptoms upon more than thirty children, who had all been vaccinated from a little girl with six punctures on each arm, the child herself having been operated upon from another who had been vaccinated from lymph preserved between two plates of glass obtained from the authorities. This misfortune created so much sensation that the Academy of Medicine of Paris sent down the Commissioners, Messrs. Henry Roger and Depaul. These gentlemen have just presented their report to the Academy, and this important document ends with the following considerations: 1. Several of the children we examined were undoubtedly suffering from secondary syphilis. 2. We see no way of explaining this contamination but by vaccination; and we are confident that the cases we have seen were really syphilis engendered by vaccination. 3. As to the origin of the virus, it is very probable that the poison is traceable to the lymph, preserved between two pieces of glass, supplied by the authorities. As primary symptoms were also observed among the children, Mr. Ricord begged the commissioners to insert that fact in their report, which these gentlemen agreed to do. Here we unfortunately have again repeated the sad occurrences which took place at Rivalta, Italy, a short time ago.—*Lancet.*

Cholera and Contagion.

In noticing a pamphlet of Dr. E. Hearne, of Southampton, on the non-contagious nature of cholera, the editor of the *Brit. Med. Jour.* quotes the following:

"M. Grimand relates that during the late epidemic at Marseilles, there were employed at the post-office twenty-two persons in the bureau for dispatching, and nine in the bureau for receiving letters. Amongst the former there was no sickness at all, whilst amongst the latter there were eight persons sick, and one death. He whose business it was to open letters from the east was attacked with cholera; four others engaged in the same business were attacked one after the other."—*Med. and Surgical Reporter, Dec.* 29, 1866.

Ingrowing Toe-Nail.

At a meeting of the Norfolk (Mass.) District Medical Society, the President, Dr. Cotting, as per report in the *Boston Medical Journal*, alluded to his method of operation for the relief of ingrowing toe-nail. He had never found it necessary to remove the nail, and in one of the cases recently operated on, the nail had been removed some years before without any good effect. His method is to remove a portion of the sound, as well as diseased flesh, from the side of the toe, say three quarters of an inch long, half an inch wide, and as thich as the member will admit of. Two cases, so operated on since the last meeting, succeeded perfectly. Dr. Stedman stated that he had recently performed the operation with complete success.—*Med. and Surg. Reporter, Jan.* 12, 1867.

Croup Treated by Sulphur.

The *Brit. Med. Jour.*, quoting from the *Gaz. Méd. de Paris*, states that M. Laganterie, from observing the effect of sulphur on the oidium of vines, has been led to administer it in several cases of croup. He mixes a teaspoonful in a glass of water, and gives the mixture in teaspoonful doses every hour; the effect he describes as wonderful. The disease is, in effect, cured in two days, the only symptom remaining being a cough, arising from the presence of loose pieces of false membrane in the trachea. Mr. L. says that he has followed this plan in seven cases, all being severe, especially the last, in which the child was cyanotic, with protruded rolling eyes, and noisy respiration.—*Med. and Surg. Reporter, Feb.* 23, 1867.

Potent Disinfectant.

The *Dublin Medical Press* states that Dr. DeWar, Kircaldy, has discovered that "for the disinfection of inanimate material, the addition of a little nitre to sulphur, and the combination of these fumes with the steam of boiling water, improvises a disinfectant at once the most powerful, most searching, and most efficacious that can be obtained, utterly destructive at once of any latent contagion, and of every form of insect life."—*Med. and Surg. Reporter, March* 9, 1867.

"*Patent Deodor Vessel.*"

We have received, from the Trenton Pottery Company, a specimen of a new chamber-vessel, with a hollow lid, intended to hold a liquid disinfectant, which is exposed when the vessel is used, for the purpose of neutralizing the foul emanations. The idea is an excellent one, and will be found to be very useful in practice. A recipe for an excellent disinfectant accompanies the vessel. We understand that the Company will immediately put these vessels on the market.—*Med. and Surg. Reporter, Jan.* 12, 1867.

☞ Napoleon having been informed that every profession but that of medicine was represented in the French senate, determined that this anomaly should no longer exist, and accordingly promoted his physician, Dr. Conneau, to a seat in the Luxembourg.—*Med. and Surg. Reporter, Jan.* 12, 1867.

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